Nursing University Students' Experience of Online Education in COVID-19 Pandemic: A Content Analytic Study

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Abstract- COVID-19 pandemic and the consequent online mode of education have challenged the national educational system and higher education. Thus, the present research aimed to explore students' experience of the advantages and disadvantages of online education at Bandar Abbas University of medical sciences during the pandemic. The present qualitative research conducted a content analysis of 26 nursing students' experiences. The sampling method was purposive. Unstructured face-to-face interviews were conducted with participants of the study to collect the required data. The interview protocol was followed. The required social distance was kept, and the ethical code was adhered to. The participants were interviewed as already arranged at a place of convenience. The interviews took between 40 and 60 minutes, depending on the immediate condition. The data collection continued until data saturation. The data analysis led to the extraction of 5 themes and 8 categories, including teacher-student miscommunication, student-student miscommunication, evaluation issues, anxiety, distancing from active learning, materials/sources, lack of physical attendance, non-educational activities, and 22 subcategories. The present findings could help professors and education authorities to better understand students' expected learning and the challenges of online education. They could, thus, be better aware of the existing barriers and could better plan to remove them.
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Introduction

The global COVID-19 pandemic is known as the most disastrous crisis in history and has affected the entire world (1). As an unprecedented crisis in global health, the COVID-19 pandemic has fundamentally changed human behavior (2). Not only has the disease affected the health staff's and the clinical workers' health and the care provided for patients, but it has also changed all communities and systems, including the academic system and university life and, consequently, education (1,3).

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), 1.2 billion students were faced with closed schools and universities worldwide (4). In the emergent conditions, all medical institutions worldwide were obliged to largely limit or stop face-to-face education (3). University students got truly anxious, and many senior students lost job opportunities. Among these, nursing faculties, which were in charge of educating the future generations of healthcare providers, encountered certain challenges (1). The whole educational system was shaken on a global scale, and the educational institutions faced challenges in finding the right ways of handling the disaster (5).

The COVID-19 pandemic has made people's futures unclear, as nobody can be sure when the disease will end. In many countries, including Iran, the pandemic has led to the closure of schools and universities since the winter of 2019 to prevent the further spread of the disease. In most educational centers, online classes replaced face-to-face routine education and have prevailed ever since (6). Therefore, it can be concluded that the world has seen the greatest revolution in education from ordinary face-to-face mode to online mode (7). Many universities worldwide changed their entire operations to digital mode. At the outset, they were more concerned about how

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to use the online mode as far as they could than how to manage the quality of online education (5).

In the past decade, internet technology (IT) has significantly affected all aspects of education and has introduced a new form of education (8). Even before the pandemic, certain aspects of medical education have been held online. The practical educational aspects of these fields of study have challenged online education (3). Online education implies using electronic systems such as computers, the internet, electronic sources or drives, and so on (6). This process has been accompanied by lower costs, better flexibility, easy access, comprehensiveness, self-reliance in learning, and correspondence to personal learning objectives (8).

Due to the essential role of online education in the COVID-19 pandemic, educational institutions are expected to provide all that is required to use online education. There have, thus, significant changes in teaching and learning methods through technology (7). Universities have also attempted to set the required standards for rapid implementation of online education by the affiliated divisions. In universities of medical sciences in Iran, the NAVID system and Adobe connect have been the most common learning management systems meanwhile (9).

Online education has also caused a number of problems in installation, log-in, upload, audio-visual quality or services, teacher-student or student-student miscommunication, and limited chances of rehearsal after the class (5). These can all lower the quality of instructions. The body of research conducted before the pandemic showed that half of the university students participating in online courses left the course due to the low quality. Some other research showed that despite the overall satisfaction with online education, learners complained about several drawbacks, such as lacking technical skills, miscommunication, delayed feedback, and inactive learning due to distraction or personal interactions (7).

In a study of the online education courses offered by Shiraz University in 2017, the reported issues prevailed in education, management, support, communication design, evaluation, and organization (10). Another survey of university students' satisfaction with online education during the COVID-19 pandemic in Pakistan showed that the most common problems were, respectively: connection and lack of resources (38.2%), miscommunication with teachers and classmates (29.1%), absent-mindedness (12.7%), inactivity (10.9%), and finally the absence of the right conditions at home for attending the classes (7). Similarly, another study in Bangladesh showed that most university students failed to participate fully in classes, failed to communicate effectively with peers, did not adequately comprehend the course content, and did not feel well in class. They mostly preferred face-to-face classes but had no choice but to attend online courses during the crisis (11).

The data analysis by Bakouei *et al*., in the nursing and midwifery faculty of Babol University of medical sciences during the COVID-19 pandemic revealed three categories: benefits, barriers, and strategies for promoting the quality of online education. The subcategories included "flexibility and appropriate setting for teaching/learning," "lacking skill in teaching online courses by some teachers," "ineffective learning," "students' failure to plan for studies," "invalid evaluation and system software and hardware problems," and "optimizing online teaching methodology, holding online classes, uploading video files and effective evaluation" (12). Moreover, Farsi *et al*., showed that 66.2% of nursing university students were satisfied with the quality of online education, and the satisfaction level of 56.3% was medium-level (6).

Quality and quantity are at the core of education development and promotion. Educational development is particularly correlated with both quality and quantity. Educational development is deemed fruitless without considering qualitative and quantitative growth. Besides, feedback is an inevitable part of a system, and if correct, it can help promote teaching/learning, promote the whole educational system and enhance the learning process.

Thus, based on the recurrent feedback received from learners during the online educational experience they had during the pandemic, we aimed to conduct a qualitative study and a content analysis of nursing/midwifery university students' experience of Hormozgan during the COVID-19 pandemic.

Materials and Methods

The present research used conventional content analysis to explore nursing students' experience of online education during the COVID-19 pandemic. After the approval of the University Ethics Committee (IR.HUMS. REC. 1400. 313), data were collected in 2021 from the nursing/midwifery faculty of Bandar Abbas University of medical sciences, a well-known science and research center. The sampling was purposive in type. The inclusion criteria were being a bachelor's student of nursing, willingness to participate in research and a

written letter of informed consent. The data collection continued until data saturation (i.e., when no new information emerged and only the previous information was confirmed or repeated). The data were collected through unstructured interviews within three months (March to May). The interview began with an open-ended question ("What is your experience of learning online courses during the COVID-19 pandemic?"). Then, the next questions followed based on the answer to the first question and in line with the purpose of the research. The interview was held individually and face-to-face with the right social distance kept. The interviews were held upon an appointment already made with each participant in a calm and quiet place in the nursing faculty at an appropriate time. The interviews took between 40 and 60 minutes with an emphasis on the interviewee's convenience.

Data collection and analysis (qualitative in type) were done simultaneously. The data analysis was done immediately after each interview until data saturation. The analytic method was conventional content analysis aiming to provide an in-depth understanding of a matter. The researcher did not adhere to any presumed categorization of findings and let the categories and subcategories emerge. The expected result (of the conventional content analysis) was a model development (13). In the present study, the analysis began with a recurrent review of the textual data and created an overall sense of the data. The analysis continued until the data saturation occurred. Before the research, it was decided to look for both explicit and implicit meanings. Then, the

analysis units (i.e., sentences with specific meanings) were identified, and the main themes in each unit were known as the meaning units. Each meaning unit was assigned a primary code. The secondary codes were also set and subsumed under each primary code. Then the primary codes with similar meanings were put together and formed the categories. The main themes were also created by comparing and integrating similar categories (14). Ethical considerations were also taken into accounts, such as the right to withdraw from the study whenever a participant wanted, the confidentiality of the information, and the anonymity of the participants.

To increase the internal validity of data, a member-checking method was used. To this aim, after each interview, the transcribed content was returned to the participants to confirm its accuracy. To increase the external validity, a rich and thick description of the dataset was used. To increase the reliability of data, the organization method of the recorded data was used. In the data collection and extraction step, the audit trail was employed.

Results

A total number of 26 B.S. students of nursing participated in the present qualitative research. Their average age was 21.1 ± 2.4 years, and 51% of the participants were female. The mean duration of the interviews was 48 minutes. In this study, 5 main themes, 8 categories, and 22 subcategories were extracted. The main categories included personal and professional characteristics, as summarized in table 1.

Table 1. University students' categorization of online education

Main theme	Categories	Subcategories
Educational communication	Teacher-student: Teacher-student miscommunication Student-student: Student-student miscommunication	Absence in the class environment, The problem in communication, Misunderstanding, One-way teaching (teacher-centered class), Lacking knowledge of student's weaknesses, Unfamiliarity with classmates, Less team or group work
Student evaluation	Peculiar and Unusual	The novelty of evaluation type, Lacking correspondence between teaching and testing, Limited time in the final examination, No access to course materials (sources)
Class and exam attendance	Anxiety	Problem logging in the class and the hyperlink, Internet connection problem
Learning the material	Distancing from active learning	Lack of Q&A in class, Distraction, Lacking attention to materials, Failure to perceive the significance of materials, Inadequate content, Low power of critical thinking
Advantages	Sources, Lack of physical attendance, Non-educational activities	Access to sources, audio-visual files, Lower chance of affliction with COVID-19, Chance of doing non-educational activities

Educational communication

A main theme in the present research was educational communication, along with the two categories of teacher-student and student-student communication. These categories were defined as "teacher-student" and "student-student miscommunication" in online classes. The former had a number of subcategories, including absence in class, difficulty in communication, misunderstanding, one-way communication (teacher-centered), and no recognition of students' strengths and weaknesses. Student #2 stated: "When we are not present in a real class and cannot see the teacher, the real teacher-student communication is not realized. The student has a passive role, as the teacher becomes the sole speaker. You cannot even ask a question. It is hard to type in the chat box as the fonts get mixed up, and even sometimes a misspelling can cause misunderstanding".

Here is student #9's comment on teacher-student miscommunication: "In an online class, the teacher cannot know the student's strengths and weaknesses. I myself was good at reading and interpreting cardiograms. As soon as I saw a slide that the teacher showed, I could tell what it meant. But because the classes were not face-to-face, the teacher could not see and appreciate my skill. I had a good command of reading ECG, and if the classes were face-to-face, I could volunteer and show my skill. The teacher would then appreciate it. The same goes for our weaknesses. There is no way the teacher can know our weaknesses".

Concerning the student-student miscommunication, the subcategories found were unfamiliarity with classmates and poor teamwork. With this concern, student #4 stated: "Now I am a freshman in the second semester. I hardly know any classmates. I have just seen their names in the class and nothing more about them. I think this is a major disadvantage of online education". Student #24 described her experience of online education: "University students' less familiarity with each other can lower the quality of group activities in different fields of study and research."

Student evaluation

Student evaluation was another main theme extracted from the interview content. The categories were "peculiar" and "unusual evaluation." The subcategories were the novelty of evaluation type, heterogeneous evaluation, limited time in final exam production-type items, and limited access to course materials.

In most interviews, the online evaluation was described by students as peculiar and unusual. They found it unusual as they had never before had a similar experience and, thus, found the new experience stressful. They also described the evaluation process as peculiar as they could not justify the goal of evaluation to be anything other than what they learned. Students reported a mismatch between the course content and the examination content. This is how student #6 described her experience of online education: "The first time I attended an online class, everything was brand new to me, and I did not know what to do. I did not even know how to move to the next question. Everything was strange to me. Though I had watched the instructional video on how to go through an online test, the actual experience was a great shock ".

Several students (#6, 11, 15, 18, 19, 24) described online evaluation as peculiar because there was hardly any match between the educational goals and student evaluation goals. In other words, what was taught in the online class differed from what was tested. With this respect, student #21 commented: "The teacher presented a PowerPoint file in class in which the types of arrhythmia were only named. The teacher only showed us a schematic image of arrhythmia, but in the exam, many complicated arrhythmia types were included. The medicines tested in the exam were very different from those introduced in class. These contradictions were really annoying ". Similarly, student #4 described her experience of online evaluation: "We had a production-type exam with 8 questions that required lengthy answers. We only had 40 minutes, while it only took 10-15 minutes to upload the answers. We were pressed for time. I wish our teacher reconsidered the time limit".

Another subcategory of student evaluation was no access to course materials (sources). What the students meant was that the material was omitted from the platform before the exam time. Or, the material to be covered in an exam was not uploaded on the website. Here is what student #26 put forth: "The teacher was supposed to upload a file for further reading, but forgot all about it. We reminded him several times, but he kept forgetting, and". Another student commented: "The booklet which was supposed to be reviewed for the exam was omitted from the website three weeks before the exam. So, we did not have access to the file anymore. I, who had not downloaded the file earlier, could finally take the source from a friend. Some other classmates, who had not noticed the elimination of the source, missed it entirely and could not answer the related questions in the

exam".

Class and exam attendance

Another major theme extracted from the interviews was "attendance in class and exams." The respective category involved anxiety, and the subcategories were the problem in logging into the class or exam and internet connection. Students felt anxious when they found it hard to log into the class or exam session due to the low speed of the net. With this concern, student #20 commented: "At the beginning of the course, they gave us a log-in hyperlink which differed across teachers and courses every hour. If you did not have the link at the beginning of the session, you could not enter the class unless you asked for permission to attend the class as a guest and waited for the teacher to let you in. This was truly stressful ".

Student #10 also commented on online class attendance: "The day when I was supposed to recite a lesson, I could not enter the class for connection problems. The class had started, and the teacher thought I was not prepared. It was a hard day, and I was all worried that the teacher misjudged me ".

Similarly, student #8 explained: "We managed to log in morning classes better than others. When it was closer to noon, things got harder to manage. The platform seemed to get disrupted". Student #12 talked about her concerns about attending the final exam: "Since the beginning of the exam, we only had 3 minutes to enter, and if some internet connection problem occurred, there was no way to log in again and take the exam. I was so stressed that I even forgot my username and password. Fortunately, I faced no problem entering the exam session, but every time at least one or two students got into trouble."

Learning the material

Learning the material was another major theme extracted from this study. The study participants' mentioned distancing from active learning as their experience of learning the material. The subcategories were the lack of Q&As in class, distraction, lacking attention to instructions, lacking perception of the significance of the materials, low-quality content, and low critical thinking. In this study, according to students' perceptions, active learning meant a kind of learning that involved all students' participation in Q & As in class, sharing of thoughts, and chances of criticism.

This is what student #5 said about learning in online classes: "When we are not in a real physical class and cannot see the teacher (as most teachers do not turn their webcams on), we fail to perceive the significance and implication of the lesson for our field of study (nursing). When we are at home, and the teacher is the sole speaker, we get easily distracted. When we deal with other stuff, we may even fall asleep…".

Similarly, student 7 commented: "I really liked the class to be run as Q & A. We needed chances to speak our minds and think more about the discussions and patients. We needed more critical thinking. But it seemed impossible, as the teacher was the sole speaker. There was no way to discuss the issues and think deeply".

Here is student #13's comment: "I do not fully agree with online classes. I think we learn less and miss the main content. The teacher's voice gets easily disconnected, and the students are often distracted". Student #22 commented: "The PowerPoint files some teachers present are not visually attractive. There is too much text and scarcely any image or video to help us understand the content better. When the content uploaded and taught is low-quality, when the form, color, and attraction of the PowerPoint presentation are poor, the scientific content is limited and old, and we do not learn as we should. This is exactly what happened to us this semester".

Advantages

The last theme raised here is the advantages of online education as perceived by nursing university students. The categories are sources, lack of physical attendance, and non-educational activities. The subcategories are access to sources and audio/visual files, a lower risk of affliction with COVID-19, and the chances of doing non-educational activities. The students' overall perception of online education was not positive. The advantages of online education could only be extracted from three interviews. With this concern, here is student #16's comment: "When those in charge have set up classes that we can attend while at home and far from the risk of the disease, this is a privilege. We may not fall behind in our studies during the pandemic. This is the advantage of online education that we do not have to physically attend classes and threaten our own and others' health". Similarly, student #23 explained: "The good point about online education is that the teacher uploads the files in NAVID system (for university students) where we can access it as many times as we want. We can watch the files or listen to the teacher's audio-recorded files at our convenience. When the sources are available, students learn better ".

Student #21 also mentioned: "I do physical exercises, actually professionally. These online classes helped me both participate in instructional courses and do sports as I wished. It is a pleasure that we have the chance to do non-academic work beside our curricular tasks and activities".

Discussion

The COVID-19 pandemic was a global threat to health and influenced all aspects of human life, including education. Considering the dramatic effects and the challenges of online education, the present research aimed to explore nursing students' experience of online education during the COVID-19 pandemic. The content analysis of the interviews with university students showed that their experience of online education could be divided into several main themes: educational communication, student evaluation, class and exam attendance, learning the materials, and the advantages of online education.

The educational communication theme was divided into several categories as the challenges of online education perceived by university students: teacher-student miscommunication and student-student miscommunication. Similarly, in a body of research by Lakbala (15) and Wingo (16), limited communication with the teacher was also mentioned as the main challenge of online education. In a similar vein, Ilonga *et al.*, stated in their study that limited interactions could demotivate students and confuse them in assignments (17). Also, Surkhali and Garbuja mentioned the absence of face-to-face communication as a barrier to teachers' awareness of students' nonverbal behaviors, disappointment, and interest in-class participation. The teacher's failure to share his/their feelings was a barrier to student motivation and enthusiasm to participate in class by both parties (teacher and student) (18). In agreement with the present findings, Carpenter also found that nurses preferred face-to-face interaction with the teacher to learn things better (19). Rezaei *et al.*, also drew attention to less face-to-face interactions and verbal and interpersonal communication in online education and emphasized that this mode of education has reduced the rate of direct communication. Verbal communication has been replaced by non-verbal communication through groups and channels. People spend lots of their time in these channels and groups (20).

The other themes extracted from the content analysis of interviews were: peculiar and unusual evaluation (due to the novel and unprecedented nature of evaluation),

lacking correspondence (mismatch) between teaching and testing, limited-time set for the production-type final exams, and no access to materials. Evidently, if the teaching is all right, but the evaluation is not appropriate, this can lead to students' dissatisfaction. Using online education requires a change of evaluation methods. For instance, during the pandemic, in some universities, the traditional scoring system was replaced by an overall evaluation based on whether a student passed a given course or not (21). Limited access to the materials needed for exams and evaluations is one reason for students' anxiety about the exam and evaluation. This is consistent with the studies by Sahu *et al.*, and Morin, who concluded that limited access to sources and references are challenges that can disrupt education and evaluation (21,22). Mandatory face-to-face exams (in online education), giving no final score, and students' failure at exams due to the shortage of time were among the existing challenges mentioned by Shafiei *et al.*, (10). Part of the evaluation process has to do with the assignments (homework). In their research on nursing students, Teflord and Senior reported concerns about the form of feedback on assignments and the provided answers and making sure of their accuracy as a problem facing university students. The strategies they suggested included a more effective plan to provide feedback on the assigned homework to increase satisfaction with evaluation and lower students' concerns and confusion (23). Thus, medical science educational centers are advised to use both evolutionary and accumulative evaluation methods in an online mode (3).

Concerns about the potentially interrupted participation in classes due to limited access to the internet and problem logging in the class or exam link were some other challenges extracted from the interviews. As perceived by most university students, these problems have disrupted the teaching process. Evidently, in fostering electronic learning, the technology factor (e.g., infrastructure, network, software, and hardware) is key to education (24). The findings reported by Abo-Seada, Saint-Marc *et al.*, showed that not all students accessed the required devices for online education, which is consistent with the present research (25-26).

Similarly, in a study of nursing students, limited access to the internet and connection problems were the main challenges experienced and reported in distance learning by students (3). For instance, living in rural areas is one reason why many people may not have adequate access to internet services, as mentioned in several studies

(17,27,28). Thus, considering the current conditions and the necessity of online education, the facilities and equipment needed for this purpose should be improved.

Another theme extracted from the content analysis of interviews was ineffective learning and distancing from active learning, which could happen for different reasons. These can include the lack of Q & A in class, distraction, not paying enough attention to materials, failure to perceive the significance of materials, poor quality content, and poor critical thinking. In another study, Faize and Nawaz mentioned students' distraction in online classes caused by classmates' interference, the noise and sources of distraction at home, and the distractive presence of family members as the existing problems of online education. These are in agreement with the present findings (7).

The mismatch between the content and course design in online education and the inadequacy of instructional materials for online teaching were stated as the main challenges perceived by nursing students in a study by Harerimana (29). More than half of the nursing course content has to do with practical skills expected to be acquired in clinical settings. The current conditions can impede the acquisition of practical skills and can, thus, cause dissatisfaction with online education. Attempts have been made to teach practical skills through videos. Yet, these attempts cannot, on their own, suffice for the main practical courses in the nursing domain. Also, Surkhali and Garbuja pinpointed that online learning, especially in medical sciences that require clinical learning, has faced major challenges (18).

Besides the challenges of online education, there are certain advantages, too, including access to audio-visual files, lower risk of the disease, and chances of doing non-educational activities mentioned by the present participants. Contrary to the present findings about uploading video files, Mayer *et al.*, showed that using videos in online classes (due to their one-way and lack of interactive nature) cannot lead to in-depth learning and creative thinking. Therefore, the teaching channel requires many changes so as to cater to more teacher-learner interaction and change from passive to active learning (30). In another study, Salimi mentioned family obsessions, chances of educational innovations, and fostering educational equity as the advantages of online education (31). Generally, the present findings showed that besides the advantages, there are serious challenges and concerns too which need to be taken care of to improve the quality of education.

In light of the present findings and the significance of implementing online education in the COVID-19 pandemic, certain interventions and strategies are required to improve the quality of this educational mode by teachers and students. Online education can be used to lower costs. Thus, there should be more cooperation in teaching and learning to create a chance for a stress-free learning environment for all students. The present findings help better understand students' expectations, challenges, and barriers to effective online education and teach online courses more effectively.

Acknowledgments

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