Original Article

The Viewpoints of Faculty Members and Midwifery Students on the Implementation of a Virtual Clinical Training Protocol for Midwifery Internship in a Gynecology Course During COVID-19 Pandemic: A Descriptive Qualitative Study

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Abstract

Background & Objective: It is essential to apply the complementary methods of face-to-face education to prevent clinical education disruption during the COVID-19 pandemic. The present study aimed to explain the viewpoint of faculty members and midwifery students on implementing a virtual clinical training protocol for midwifery interns in a gynecology course during the Covid-19 pandemic.

Materials & Methods: This descriptive qualitative study was performed in Sari Nursing and Midwifery faculty, Sari, Iran, 2020. Purposive sampling continued until data saturation and finished with 16 participants (9 midwifery students and 7 faculty members). A deep semi-structure interview was conducted to collect data. The data analysis was carried out by content analysis with a conventional approach and based on the steps proposed by Graneheim and Lundman.

Results: Four main themes were extracted, including "strengths", "weaknesses", "obstacles", and "facilitators" of the virtual clinical training. These themes consisted of ten sub-themes. Continuous learning, learning development, and facility of education in the crises were strong points of this education method, and its weaknesses were limitations of some educational dimensions and evaluation challenges. The obstacles to virtual clinical trainings were sub-structure problems and educators' challenges, and the facilitators of this method were strengthening electronic technology, providing prerequisites, and training promotion. scores and the difference between genders was statistically significant.

Conclusion: According to faculty members and midwifery students, although virtual training gynecology clinics could help access a part of educational goals, there are limitations to promoting some dimensions of professionalism. Furthermore, providing infrastructure and prerequisites can improve the efficiency of this method.

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Introduction

Over the past two years, the spread of the COVID-19 disease has disrupted various activities, including the education of students in universities worldwide. Although most universities have moved rapidly toward e-learning, distance learning is challenging in medical fields, and achieving educational goals is not easy because clinical education in the real setting is an integral part of the learning process. The presence of students in health care centers during the COVID-19 pandemic could expose them to infection and the possibility of increasing the spread of the disease due to direct contact with patients, the possibility of contamination with the virus, and the limitations of universities in providing personal protective equipment (1). On the other hand, fewer patients refer to medical centers for fear of being infected with the virus causes students to face a smaller number and variety of diseases. Therefore, it is necessary to adopt new educational methods to prevent clinical education interruptions while maintaining quality. In this regard, researchers involved students of different medical departments in clinical care and introduced innovative virtual learning methods, including virtual rounds in the virtual setting (2, 3), digital clinic (4), and virtual patients (5-7).

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E-learning is one of the virtual learning strategies. This method can be implemented in various ways (e.g., on the Internet, computers, and smartphones) (8). Based on 33 studies, the World Health Organization reported that computer-based learning significantly increases medical students' knowledge compared to traditional methods (9). A review study showed that the effect of e-learning on the clinical skills of nursing students is not less than face-to-face training (10). The results of another meta-analysis indicated that e-learning improves the performance of novice medical and nursing students; however, its impact on improving cognitive ability is limited compared to traditional education (11). Although engaging with the actual patient is essential in clinical education, innovative virtual solutions can provide an opportunity for the student to engage with real patients (3, 4, 6, 7). Some qualitative studies in universities in Iran and other countries explained the views of medical professors and students on different methods of virtual education (12-17). In most of these studies, the lack of technology infrastructure, teachers' unfamiliarity with e-learning styles and standards, and students' unwillingness to adapt to changes in learning styles were reported as challenges in this teaching method (12, 14-16). Although some argue that it is unrealistic to expect a virtual clinic to replace face-to-face clinical skills training, it can be helpful as a supplement to clinical education (1). Furthermore, according to some nursing professors, the virtual clinic alone does not make nurses clinically competent because acquiring clinical knowledge and skills requires a suitable interactive platform (18). However, in the other two studies, nursing students positively viewed education through a virtual clinic. They considered it an opportunity to increase learning in clinical situations they do not encounter in routine education (12, 13).

Due to the inevitable changes in the training methods during the COVID-19 pandemic, universities have to evaluate the consequences of these methods to be prepared for other critical situations. Because there are different perspectives on virtual clinical education, the nature and curriculum of clinical courses vary in different fields, and also, by searching, stakeholders' views on virtual clinical education in the form of virtual clinics for midwifery students have not been reported so far, being aware of faculty and students' opinions in this field can help identify the strengths, weaknesses, and challenges of this program. As a result, the present study was conducted following the design and implementation of a virtual clinic protocol to explain the views of midwifery faculty and students on the implementation of a virtual clinical training protocol in internships for gynecology course during the COVID-19 pandemic.

Material & Methods

The present study was descriptive qualitative research. Qualitative description is a title used in qualitative research for descriptive studies, especially to investigate health care and nursing-related phenomena (19). This study was conducted using a content analysis method with a conventional approach and based on the proposed steps of Graneheim and Lundman (20). The content analysis method is used to describe a phenomenon when theories or research on it are limited (21). No previous theoretical framework was selected for this study because the researchers sought to gain an unbiased view of the experiences of students and faculty members in the e-learning clinic for gynecology.

Participants were purposefully selected from the students and faculty of Sari School of Nursing and Midwifery who participated in the virtual clinic of the gynecology unit during the COVID-19 epidemic for two semesters in 2020. Inclusion criteria were: midwifery students in their internship who passed gynecology according to the protocol of the virtual clinic and the faculty who collaborated in designing and conducting the virtual clinic (5). The sample size was determined based on the achievement of data saturation; that is when the majority of participants expressed a similar view, and no new data was obtained from their experiences (22). Maximum diversity in the selection of participants was also considered; in this way, students from different grades (second and fourth years) and a variety of GPA levels and faculty with different specialties (reproductive health, midwifery education, and counseling in midwifery), different academic levels (lecturer and assistant professor) and low to high work experience were selected. None of the invited participants withdrew from the study. Data collection was completed with 16 participants (9 midwifery students and 7 faculty members).

In quarantine conditions, data was collected by calling the participants with prior time coordination and observing all issues that create psychological security and privacy to freely express their thoughts, feelings, and perceptions.

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The participants' perspectives were examined through in-depth semi-structured individual interviews with open-ended questions to evaluate the quality of the previously implemented virtual clinic protocol (5). At the beginning of each interview, after explaining the objectives and steps of the study and assuring the participants about the confidentiality and secrecy of the name and the recorded interview, written consent to participate in the study was sent to the participants through social networks and after signing, it was obtained from them. Interviews began with completing a demographic questionnaire and continued according to the interview guide and based on the questions related to the purpose of the study, prepared by reviewing the texts and had already been validated by 3 midwifery faculty. The interviewers were two researchers of the project, a member of the faculty of midwifery with a Ph.D. degree and a master with previous experience in conducting qualitative studies. Students and faculty members were asked to share their experiences with the virtual clinical training protocol during gynecology internship course.

The following questions were used as an interview guide: due to the COVID-19 pandemic and change the clinical training to the virtual method explain your opinion about this method; tell about your experience with virtual clinical training; what obstacles did you see in this method for a positive educational experience?; what are your suggestions to create a positive learning environment during virtual clinical training? And how do you evaluate the clinical training of gynecological diseases through the virtual clinic method? During the interview, if required, the participants were encouraged to explain further, depending on the answers, by asking additional questions, and if there were any points, they would be written down. Probing questions were also used during the interviews to monitor understanding of participants' statements and to describe further topics (e.g., please explain more about this, what do you mean, why, and how). At the end of the interview, students and faculty were asked to speak if there any statement was left. The duration of the interviews varied from 30 to 45 minutes, depending on the full presentation of the experiences. Recorded interviews were transcribed at the first opportunity. In cases with ambiguity, it was resolved by contacting the participants again. With the consensus of the project researchers on data saturation, sampling was stopped.

The data analysis process was performed according to the content analysis and the steps proposed by Graneheim and Lundman. The steps were: 1) preparing the text of the interviews and reviewing it several times to find a correct understanding of the whole case, 2) Extract semantic units and categorize them as compact units, 3) Summarize and categorize compact units and select the appropriate label for them, 4) Sort subcategories by comparing similarities and differences between them and 5) Choose a suitable title that can cover the resulting categories (20). Following these steps, qualitative content analysis means breaking the text obtained from the experiences and statements of students and faculty into small sections and analyzing them descriptively and manually. First, the audio files of the interviews were handwritten, and then, by carefully studying the manuscripts, an attempt was made to obtain their external and internal elements. The texts' sections were obtained by the first author and the second author of the article summarized and coded them. Subsequent interview codes were compared with each other and previous interview codes to classify based on existing similarities and differences. The categories were reviewed multiple times and compared with each other, and eventually, the research team agreed on categories and subcategories. An example of class coding and extraction is reported in Table 1.

Four criteria of credibility, conformability, dependability, and transformability were used to ensure the reliability of the data (23). For the validity of the data (credibility), efforts were made to select participants with the maximum variety of experiences. Participants were selected from among eligible students via a purposive sampling method with maximum diversity in terms of GPA and grade. Sampling was continued until data saturation. faculty with different duration of employment and specializations entered the research. Active listening and transparency techniques were performed to obtain valid data and prevent bias. In addition to sufficient time to collect data, there was a constant and reciprocal conflict with the data. The results of the analysis of the findings were also given to the participants and a group of experts for confirmation. Any discrepancies were reviewed and considered. In addition, during the data collection and analysis process, a review was performed by two researchers, and re-contacting participants clarified vague cases. If there was a disagreement between the researchers in coding and naming the categories and subcategories, an agreement was reached by discussion and reviewing the text of the interviews. Finally, all codes, categories, and subcategories were reviewed by a person who was not among the research team. For transformability, the study steps and performed activities were described.

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Purposeful sampling with maximum diversity helps to ensure transferability. For conformability, the researchers tried not to interfere with their assumptions as much as possible in data collection process and analysis and remained impartial during interviews. During the review of raw data, the comments were reviewed and decided with the consensus of other research members. For dependability, all interviews were recorded and converted verbatim to a text file. To reduce the likelihood of instability of data, the researchers tried to ask all participants questions in the same areas. Two senior researchers separately prepared and coded the interview data, and then the results were compared and decided. In addition to reviewing some of the extracted concepts, the opinions of an observer outside the project were also used.

Results

In total, 47 midwifery students implemented this protocol, of which 9 were interviewed. Of these, 5 students were in the fourth year and 4 in the second year. Seven faculty members with 10 to 28 years of experience were also interviewed. The characteristics of faculty and students are reported in Table 2. Opinions of midwifery faculty and students on the implementation of the virtual clinical training protocol in gynecology course internships during the COVID-19 pandemic were extracted into four main categories or themes, including "Strengths", "Weaknesses", "Obstacles" and "Facilitators" of the virtual clinical training. In the case of these categories, 168 codes were obtained without overlapping; after integrating them for more accurate coding and facilitation in the research process, 31 codes remained. Categories, subcategories, and selected codes are shown in Table 3.

1- The strengths of virtual clinical training

The "strengths of virtual clinical education" category is manifested in three subcategories of "continuity of learning", "development of learning", and "facilitation of education in crisis".

a) Continuity of learning

The students and faculty participating in this study pointed to the benefits of teaching in a virtual clinic during the outbreak of the COVID-19, indicating reproducibility, availability, and flexibility. In this regard, the statements of the participants were as follows: Reproducibility: "This is so good that we can review the information of every case we want again." (Student 3)

Availability: "In my opinion, it is an advantage that we can have all information about patients without referring to the professor or worry about missing some points in our notes." (Student 7)

"In the real environment, there may not be enough time to work with each student, or their weaknesses are not identified in some parts, but here, because all the students answer the questions, the problems are identified and fixed." (Faculty member 2)

Flexibility: "The strength of this method is that the education program can be changed according to the conditions and needs of students". (Faculty member 1)

"Because both the teacher and the student are not limited to a specific time or presence in a particular place to hold a training session, it increases the efficiency of this method." (Faculty member 5)

b) Development of learning

Participants cited items in their quotes that indicated this subcategory. In other words, equal learning opportunities, developing skills before dealing with the actual patient, student-centered education, facilitating information transfer, disease diversity, development of critical thinking, and problem-solving skills are among the strengths of e-learning. In this regard, participants stated:

Equal learning opportunities: "Because the cases are presented to all students and all answers are reviewed, and mistakes are explained, the training runs the same for everyone." (Faculty member 6)

Developing skills before dealing with the real patient: "This method helps us take the necessary actions when facing the real patient with more readiness and confidence."

Student-centered education: "One of the advantages of this method is that the student is active." (Student 9)

Facilitating information transfer: "Information about the various dimensions of a disease, from the symptoms and diagnosis to the necessary treatment and counseling can be provided to all students." (Faculty member 4)

Disease diversity: "In face-to-face training, it is unlikely that all of these cases will be referred to the centers, while in e-learning, we encountered various gynecology cases." (Student 6)

Developing critical thinking and problem-solving skills: "In this way, students' minds are challenged, and instead of giving information about the disease from the beginning, students are encouraged to ponder and find answers by asking questions in various clinic areas." (Faculty member 3)

c) Facilitation of education in crisis

Participating students and faculty members pointed to the benefits of virtual clinical training, including preventing the spread of the disease during pandemic and avoiding delaying clinical education in crisis. In this regard, they stated: Preventing the spread of the disease in a pandemic: "With attendance in training centers, we worried about

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transferring it to other family members, even if we did not get sick ourselves. Virtual education relieved our families and us in this regard." (Student 8). Avoid delaying clinical education in crisis: "Because it is not clear how long this pandemic will continue, planning for clinical education is very difficult. In this way, a part of the problem is solved." (Faculty member 1).

2- The weaknesses of virtual clinical training

The second category extracted from the analysis of the statements of students and faculty concerning the virtual education experience during the COVID-19 epidemic was the category of "Virtual Education Weaknesses", which included two subcategories, limitation of some educational dimensions and evaluation challenges. Shows examples of quotations in this regard are shown in Table 1.

Table 1. Examples of quotations, coding and abstraction of category and subcategorise

category	Sub-categoris	Primary codes	qutations
The weaknesses of virtual clinical training	limitation of some educational dimensions	Impossibility of clinical examinations	"One of the things I need to learn and practice is patient exams, which unfortunately were not possible in this way." (Student 5)
		No opportunity to develop communication skills	"Because student did not face the real patient, it was not possible to face the challenges of communicating with the patient and practice meeting them." (Faculty member 7)
		Less face-to-face interaction of students with each other and the trainers	"Because each of us answered the questions independently, it was impossible to discuss with our classmates and the faculty members." (Student 4)
	evaluation challenges	Dishonesty in answering	"Sometimes, the answers seemed duplicated, and I could not trust that the answers were given independently." (Faculty member 2)
		Student's weakness in descriptive response	: "Unfortunately, students are accustomed to multiple-choice questions and do not know how to answer descriptive questions, add explanations, or do not understand the question." (Faculty member 7)

3- The obstacles to virtual clinical training

The third category extracted from the analysis of participants' experience of e-learning through the virtual clinic included the category of virtual e-learning barriers with two subcategories of sub-structure problems and educators' challenges.

a) Sub-structure problems: About this feature, students and faculty presented their experiences as follows: Lack of proper communication tools: "I do not have a computer, and my mobile phone is not advanced, so I had problem receiving the content." (Student 4)

Lack of skill in using electronic technologies: "I am not very good at using the Internet, especially new sites. Initially, I had to get help from someone to get into the program or send answers." (Student 6)

Costs: "Provide appropriate communication devices such as smartphones or computers as well as preparing electronic content and using the Internet, costs money for both faculty and students. So financial support is expected from educational institutions." (Faculty member 3)

Problems with the support system: "The designed virtual educational program has some drawbacks. It needs to be completed for easier use by both faculty and students." (Faculty member 7)

Lack of proper Internet coverage for rural areas: "I live in a village, and the Internet was often poor in that area, and I could not receive or send content in time." (Student 6)

Low Internet speed: "Internet speed is very slow, and it took me a long time to download or send the files." (Student 8)

b) Educators' challenges: According to the experiences of the participants, this subcategory emerged as an obstacle to virtual clinic-based training: Being time-consuming to design and implement: "In general, it took much time to prepare the materials and upload them in several steps and correct the answers and reply to each student." (Faculty member 2)

Lack of job incentives: "Many co-workers may not be motivated enough to use this type of training because although it requires more time and activity than face-to-face training, no special privileges are currently considered for it, and it is equivalent to face-to-face training." (Faculty member 7)

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4- The facilitators of virtual clinical training

Another emerged category in this study was the facilitators of promoting virtual learning through the virtual clinic. It was identified with three subcategories: strengthening electronic technology, providing prerequisites, and promoting training.

a) Strengthening electronic technology: Some quotes from students and faculty were:

Use a designed site for virtual learning: "If a site is considered easy to work with and has more features, it can be a suitable method." (Student 8)

Upgrading the infrastructure for electronic technology: "I think both faculty and students should be encouraged to use this method if sufficient and update facilities in terms of required tools and knowledge are predicted in advance." (Faculty member 2)

b) Preparation of prerequisites: Another topic that all students mentioned was to provide facilities for students to use the Internet and train them to use electronic technologies. They stated:

Provide facilities for students to use the Internet: "All cannot have an advanced mobile phone or laptop; even the cost of high-speed Internet is difficult for some. It would be great if the university could provide some help in this regard." (Student 4)

Train students to use electronic technologies: "Some of my friends and I did not know how to upload the answers on the site or access the files. From this point of view, it was difficult for us to learn at first." (Student 2)

c) Training promotion: Participants' statements included the following:

No time limit for access to information: "If this information is not deleted in the system and remains for a long time that we can refer to it, it will be more helpful." (Student 8)

Add additional training methods: "However, some clinical skills can be taught this way, I think better results will accompany the integration with traditional training and training in skill lab." (Faculty member 3)

Consider incentives for faculty: "Because this method takes much time from the trainer, so that the faculty should have enough motivation to do it, it is necessary to see this extra activity in some way." (Faculty member 5)

Table 2. Characteristics of midwifery faculty and students

number	Faculty			Students		
	Age (year)	**work experience** (year)	**Specialty/academic degree**	**Age** (year)	**GPA** (0-20)	**Grade**
1	55	20	Midwifery training/ Lecturer	23	15.46	4thyear/ B.sc
2	56	28	counseling in midwifery / Instructor	22	17.35	4thyear/ B.sc
3	49	26	Midwifery training/ Lecturer	24	16.45	2ndyear/ B.sc (with previous associate degree)
4	35	18	Midwifery training/ Instructor	24	17.15	4thyear/ B.sc
5	40	15	counseling in midwifery / Instructor	22	16.82	4thyear/ B.sc
6	42	14	Reproductive health/ Assistant professor	25	17.36	2ndyear/B.sc (with previous associate degree)
7	53	23	Midwifery training/ Instructor	30	14.53	2ndyear/B.sc (with previous associate degree)
8	-	-	-	22	17.62	4thyear/ B.sc
9	-	-	-	27	16.55	2ndyear/B.sc (with previous associate degree)

GPA: Grade Point Average, B.Sc.: Bachelor of Science

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Table 3. The results of the content analysis of the participants' opinions about the virtual training for midwifery interns in a gynecology course

Category	subcategories	Selected basic concepts (codes)
The strengths of virtual clinical training	Continuity of learning	1) Reproducibility 2) Availability 3) Flexibility
	Development of learning	1) Equal learning opportunities 2) Developing skills before dealing with the real patient 3) Student-centered education 4) Facilitating information transfer 5) Disease diversity 6) Developing critical thinking and problem-solving skills
	Facilitation of education in crisis	1) Preventing the spread of the disease in a pandemic 2) Avoid delaying clinical education in crisis
The weaknesses of virtual clinical training	limitation of some educational dimensions	1) Impossibility of clinical examinations 2) No opportunity to develop communication skills 3) Less face-to-face interaction of students with each other and the trainers
	evaluation challenges	1) Dishonesty in answering 2) Student's weakness in descriptive response
The obstacles to virtual clinical training	Sub-structure problems	1) Lack of proper communication tools 2) Lack of skill in using electronic technologies 3) Costs 4) Problems with the support system 5) Lack of proper Internet coverage for rural areas 6) Low Internet speed
	Educators' challenges	1) Being time-consuming to design and implement 2) Lack of job incentives
The facilitators of virtual clinical training	Strengthening electronic technology	1) Use a designed site for virtual learning 2) Upgrading the infrastructure for electronic technology
	Preparation of prerequisites	1) Provide facilities for students to use the Internet 2) Train students to use electronic technologies
	Training promotion	1) No time limit for access to information 2) Add additional training methods 3) Consider incentives for faculty

Discussion

According to the findings of the present study, the faculty members and students believed the implementation of a virtual clinic could help teach clinical skills, especially in a crisis, by continuing and developing learning. Reviewing the experiences of medical college students in Belfast, Ireland, showed they felt e-learning positively affected their clinical skills learning (24). In a study in India, 84% of medical students wanted to integrate e-learning with traditional education (25). A study on medical students at four African universities found that 70.4% had a positive attitude towards e-learning (26). A study based on the design of surgical clinical scenarios for medical students in the COVID-19 pandemic showed students' high satisfaction and positive attitude toward using virtual learning spaces in the future (27). Parallel to the findings of this study, a mixed-method study reported that from the perspective of medical students, the virtual patient is an easy and motivating tool for stress-free learning, especially at the beginning of clinical work. It allows the students to create structured and logical processes, make mistakes without harmful consequences and review the available information (6). A review study found that e-learning helps nurses learn professional skills due to its flexibility, reproducibility, and continuity (28). In line with the present study, phenomenological research determining the views of nursing professors and students on online learning during the COVID-19 pandemic reported the benefits of this approach on learning flexibility, student-centered learning, and helping students achieve academic achievement (29). In addition, another review study was reported from the students' point of view; this educational method facilitates the transfer of information, faster access to the teacher to receive answers, sufficient opportunity for learning, and student-centered and deeper understanding (30). However, according to nursing professors in a phenomenological study, e-learning alone is insufficient to establish clinical

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competence (18). Moreover, in a qualitative research in Spain on nursing students during the COVID-19 pandemic, most seniors, unlike lower years, believed e-learning is not a good alternative for face-to-face clinical training. The themes extracted in this study, including care practice, uncertainty, and waste of time, indicated that students did not have a positive attitude towards the effectiveness of e-learning due to the conditions of obtaining a license for employment in their country (31). Therefore, because the employment conditions for midwifery students are different in our country and there are no centralized exams for licensing clinical qualifications, students are also expected to have different views on this issue. However, the use of different educational methods and differences in students' field in the present study can also affect opinions. As in the abovementioned study, students' views on e-learning methodologies and tools were different (31). In a study in Uganda, nearly half of medical and nursing students believed that e-learning reduces the quality of acquired knowledge and is not a suitable teaching method. This study found that factors such as monthly income, Internet quality, and having a personal computer affect the attitude towards this type of education (32). Participants in the present study considered the facilitation of education in crisis as one of the strengths of the virtual clinical training. According to another study, one of the solutions to meet the challenge of midwifery education during the corona pandemic is distance education and the use of simulators (33). Researchers pointed to the need to move towards virtual clinical teaching, including the study of clinical cases during the COVID-19 pandemic (34). To examine students' understanding of the use of virtual clinics in nursing education, they believed that distance education is a successful method in clinical nursing education and meets their educational needs (13). According to several researchers, the clinical education break in COVID-19 requires innovative virtual solutions because traditional online education cannot be a complete alternative to patient education. New methods of virtual education provide safe and meaningful interaction with patients and clinical concepts (35).

Participants in this study pointed to the limitations of the virtual clinic in achieving some educational goals that require face-to-face communication with the patient. A review study on the application of e-learning in nursing skills training concluded that one of the criticisms of this educational method is the individuality of learning and the reduction of social and cultural interactions. This finding contradicts the nature of jobs such as nursing, where communication and interaction with the client are essential principles (34). Although in the present study, only faculty mentioned evaluation challenges as one of the weaknesses of e-learning, in a qualitative study in Spain, nursing students did not feel safe about online exams. They were also concerned that their skills would not be properly assessed (31). Moreover, a qualitative study in Saudi Arabia showed that exams are one of the challenges of online education from the students' point of view (36). Differences in results can be related to cultural differences and students' views on the evaluation philosophy. Moreover, it may be due to special exams to obtain a work permit in other countries, making students more sensitive to evaluating clinical performance.

From students' and faculty members' the point of view, some limitations in the field of infrastructure and prerequisites, especially for telecommunication, such as the lack of proper Internet coverage, the problem of costs and providing the necessary communication tools, and unfamiliarity with the essential technology lead to a decrease in the educational efficiency of the virtual clinic. A review study found that most studies reported students' concerns about lack of IT skills, lack of technical support, and rising costs (30). In another study in Belfast, medical students, in addition to having a positive attitude towards e-learning, were satisfied with access to the Internet and computers and had enough skills to use information technology (24). One of the challenges of e-learning in medical education, especially in low- and middle-income countries, is insufficient resources for infrastructure and skilled professionals in this field (37). In a study conducted during the Coronavirus pandemic on medical students' satisfaction with distance education in Jordan, students' previous experience with this teaching method, active participation of professors in meetings, allocation of sufficient time, and use of multimedia tools were associated with greater satisfaction. Infrastructure and technical issues such as the quality and coverage of the internet were the most prominent educational challenges for students (38). However, lack of technical-educational support and necessary skills to use technology can disrupt the learning process (34). In a qualitative study, nursing students identified problems with Internet access and lack of technology training as barriers to this approach (31). Furthermore, according to the faculties in the present study, the time-consuming nature of electronic education and lack of motivation were some of the challenges of using this method. Virtual clinical education for nursing students was conducted at a university in Texas, USA, during the COVID-19 pandemic, and students' opinions about it were

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examined through a qualitative study. The negative comments were mostly about Internet access and professors' inexperience in teaching online (12). In another qualitative study in Iran, students reported the lack of compliance with standards for educational content and the lack of infrastructure in the field of virtual education among their negative experiences (15). A review of 28 studies also showed that the professors mentioned the time-consuming to adapt the educational content with the new technology, lack of sufficient readiness to change the teaching method, and lack of resources as obstacles to turning to e-learning (30). In a phenomenological study that explained the views of professors on the challenges of e-learning, the need for change in teaching style, time-consuming, lack of cooperation of students, and problems related to infrastructure and facilities were extracted from the themes (14).

To facilitate virtual clinic learning, faculty and students provided feedback on overcoming barriers and weaknesses, including strengthening infrastructure, providing facilities for students and faculty, and developing training. In line with these findings, a review study also reported that, according to professors, e-learning programs require new technology available in educational institutions, motivating and preparing teachers and supporting professors due to increased workload. Students also preferred to design integrated learning methods, including face-to-face communication, to enhance learning (30).

One of the strengths of this study is the simultaneous study of the views of students and faculty interested in the implementation of virtual clinical education of gynecological diseases for midwifery students, which has received less attention in other studies. Students with little clinical experience did not participate in this study, the view of different stakeholders, including managers and support staff, was not examined due to COVID-19 restrictions, Face-to-face interview was not possible, and the educational modality of gynecological diseases that can affect the findings are among the limitations of the research. Due to the lack of face-to-face training during this research, it was not possible to receive comments and compare students who have received traditional or integrated teaching methods, which is recommended for future studies.

Conclusion

According to the views of faculty and students, implementing virtual clinical education can help achieve the educational goals of the gynecology course. The disadvantage of this method is the impossibility of improving some aspects of professionalism, such as patient communication skills and clinical examinations. Because these skills are acquired in face-to-face interaction with the patient and virtual training does not provide this opportunity, it seems that these problems can be solved by integrating virtual education with face-to-face clinical education in medical centers. In virtual education, paying attention to the existing obstacles for students and faculty, including technical and financial issues, can increase their motivation to use this method more effectively. Virtual clinical training for gynecological diseases can increase the quality of clinical education in critical situations such as during the COVID-19 epidemic and in normal situations. It is suggested that this method can be improved by further diversifying clinical scenarios and adding other methods such as training in the skill lab training center.

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