

Effect of Virtual Training of Basic Clinical Skills on the Performance of Midwifery Students in the Era of Covid-19

Abassi Z.¹ PhD, Rashidi Fakari F.¹ PhD, Rezaeean S.M.² MSc, Jazayeri Nezhad N.¹ MSc, Samadi S.¹ BSc, Khodabandeh F.^{*1} MSc

¹ Department of Midwifery, Faculty of Medicine, North Khorasan University of Medical Science, Bojnurd, Iran

² Department of Midwifery, Faculty of Nursing and Midwifery, Torbat Heydariyeh University of Medical Science, Torbat Heydariyeh, Iran

Abstract

Aims: The training of practical skills and the need to learn them is one of the characteristics of training in medical sciences, which is carried out in the clinical skills center. However, due to the spread of the Coronavirus, face-to-face training has been transferred to virtual training and the clinical skills training program for clinical learners has faced serious challenges. Therefore, the present study was conducted with the aim of investigating the effect of virtual training of basic clinical skills on the performance of midwifery students during the Covid-19 pandemic.

Materials & Methods: This semi-experimental study was conducted on first semester midwifery students of Bojnurd University of Medical Sciences who entered the university in 2019 (virtual education, N=25) and in 2020 (traditional education, N=25). Students participated in the study by census method. Data were collected using a demographic questionnaire and a practical test and analyzed using SPSS 24 software and independent t-test, chi-square and Mann-Whitney U.

Findings: The mean performance score in the virtual education group was 17.54 ± 1.27 and in the traditional education group was 18.38 ± 1.13 , and there was no statistically significant difference between them ($p > 0.05$).

Conclusion: Both traditional education and virtual education can be effective in students' learning, but traditional education in the clinical environment, especially for practical courses and clinical skills, can be somewhat more effective than virtual education alone.

Keywords

Education [<https://www.ncbi.nlm.nih.gov/mesh/68004493>];
Virtual System [<https://www.ncbi.nlm.nih.gov/mesh/68014584>];
Clinical Skills [<https://www.ncbi.nlm.nih.gov/mesh/68002983>];
Midwifery [<https://www.ncbi.nlm.nih.gov/mesh/68008880>];
Students [<https://www.ncbi.nlm.nih.gov/mesh/68013334>]

*Corresponding Author

Tel: +98 (915) 1072166

Fax: -

Post Address: North Khorasan University of Medical Sciences, Shahriyar Street, Bojnurd, Iran.

Postal Code: 9453155166

Email: farzank1368@gmail.com

Received: May 1, 2022

Accepted: July 10, 2022

ePublished: October 6, 2022

Introduction

In recent years, the rapid development of technology has had a significant impact on the education and skills of medical students. Teaching practical skills and the need to learn them is one of the characteristics of education in medical sciences [1]. Acquiring the necessary competence in the implementation of these skills requires time and practice in a suitable and safe environment [2-4]. Today, in order to ensure that students learn in a safe environment, away from stress and increasing the patient's safety, training is first conducted in the clinical skills learning center in an environment similar to the real environment of the sick bed [5]. By simulating the space as closely as possible to the real clinical environment, the center provides a stress-free experience so that students can improve their clinical skills in a controlled environment using models, moulages and teaching aids [4-6] and get the necessary preparation for clinical experience in the hospital and community [7]. Training in the clinical skills center provides the possibility of skill repetition, standard learning of skill performance techniques, skill evaluation and providing direct feedback to students and reduces the possibility of medical errors and harming the patient [8].

Currently, due to the spread of the corona virus, quarantine and traffic restrictions, face-to-face training has been transferred to virtual training. In this situation, unfortunately, the clinical skills training program for clinical learners has faced serious challenges [9]. However, in the conditions of the coronavirus pandemic and unexpected restrictions for the education of medical students, appropriate options should be provided to improve the level of training of clinical skills of students.

One of the existing methods is virtual education. Virtual training is a combination of educational materials and pre-recorded videos by expert teachers. Virtual education increases the speed of teaching and learning, and each student can use available resources according to their individual talents [10]. Also, this teaching method allows the student to review or revisit more complex concepts again [9].

In fact, in e-learning, students are taught through information and communication technology using various educational ideas to facilitate the teaching and learning process. In this method, the internet and computer are used to transfer information and interact with students, and one of the important points of this method is not emphasizing the physical presence of the professor during learning [7].

Our knowledge and information about effective learning experiences in virtual education is limited, and research in this field shows that virtual education can have many negative and positive effects in order to achieve educational goals [7].

Due to the fact that no study has been conducted in the field of virtual training of basic clinical skills and considering the importance of the topic, the present

study was conducted with the aim of investigating the effect of virtual training of basic clinical skills on the performance of midwifery students during the Covid-19 pandemic.

Materials and Methods

This semi-experimental study was conducted in Bojnurd city, North Khorasan Province, Iran. The research population was midwifery semester-one students of Bojnurd University of Medical Sciences who entered the university in 2019 (virtual education, N=25) and in 2020 (traditional education, N=25). Students who wanted to participate in the study were included in the study by census method.

Data were collected using a questionnaire including demographic characteristics (including age, academic average, marital status, residence and, interested in the field of study) and a practical test. Questionnaires that were incompletely answered were excluded from the study.

In the traditional education group, the students were taught face-to-face during one academic semester, theoretical materials in the form of lectures with PowerPoint, and practical skills in the clinical skills center (practical unit). Then, at the end of the semester, the students' performance in the hospital was evaluated in person (with a minimum score of 0 and a maximum of 20), 8 students withdrew from participating in the study.

In the virtual training group, 4 members of the midwifery faculty of Bojnurd University of Medical Sciences attended the clinical skills center of the faculty and teaching hospital and prepared the desired techniques according to the standard checklist (Principles and techniques of nursing by Taylor and Potter & Perry) based on the standards of preparing educational videos, so that The necessary training and explanations about the desired technique were fully provided in the videos. Then, all the educational videos were uploaded to the Navid system for the students of the virtual group. Educational videos were presented in a planned manner, in certain sessions during an academic semester, and the students' performance in the hospital was evaluated face-to-face.

It should be noted that all the theoretical and practical materials were presented to the students of the two groups according to the standard heading of the midwifery principles and techniques unit and the relevant lesson plan.

Data were analyzed using SPSS 24 software and independent t-test, Chi-square, and Mann-Whitney U.

Findings

The mean age of the students was 20.59 ± 0.68 years. There was no statistically significant difference between the two groups in terms of demographic characteristics ($p > 0.05$; Table 1).

Table 1) Comparison of students in two groups in terms of demographic characteristics

Variables	Virtual education group	Traditional education group	P-value
Age, y (mean±SD)	19.8±1.19	21.76±1.64	0.484*
Academic average (mean±SD)	17.21±0.88	18.83±16.92	0.981*
Marital status, No. (%)			
Single	23 (92.0)	14 (82.4)	0.271**
Married	2 (8.0)	3 (17.6)	
Residence, No. (%)			
Dormitory	12 (48.0)	11 (64.7)	0.343**
Others	13 (52.0)	6 (35.3)	
Interested in the field of study, No. (%)			
Medium	4 (16.0)	4 (23.5)	0.605***
Much	15 (60.0)	6 (35.3)	
Very much	6 (24.0)	7 (41.2)	
Total	25 (100)	17 (100)	-

* Independent t-test; **Chi-square test; ***Mann-Whitney U test

No significant difference was observed between the two groups in the mean performance scores. ($p>0.05$; Table 2).

Table 2) Comparison of performance scores of the students in two groups

Groups	Mean±SD	P-value
Virtual education	17.54±1.27	0.52*
Traditional education	18.38±1.13	

* Independent t-test

Discussion

The aim of the present study was to investigate the effect of virtual training of basic clinical skills on the performance of midwifery students during the Covid-19 pandemic.

The results of the present study showed that despite the higher average performance score in the students of the traditional education group compared to the virtual education, there was no statistically significant difference between the two groups in performing basic clinical skills techniques. In this regard, Shahsavari Isfahani *et al.* [11] conducted a study with the aim of comparing the effect of using two methods of virtual (presenting theoretical and practical content through virtual systems and animation) and traditional (presentation of theory material by lecture method and practical unit through practical environment and clinical skills unit and using mannequin) education on students' ability-oriented skills. This research was carried out on two groups of 43 people in two consecutive periods of first-year nursing students of Jahrom College of Nursing and Paramedicine who had taken the nursing principles and skills lesson. The results showed that the average theory score in the virtual education group was higher than in the traditional education group

($p=0.001$). However, there was no statistically significant difference between the average practical grades, despite the fact that this average was higher in the traditional education group ($p>0.05$). This confirms that the two groups were similar in terms of their ability to perform the skill correctly [11].

As mentioned in Shahsavari *et al.*'s study, virtual education may be able to increase people's theoretical score compared to traditional education, which can be due to frequent reading and watching of educational videos, but virtual education alone cannot significantly increase the average practical score compared to traditional education. It seems that learning practical techniques requires traditional education and the presence of students in a real clinical environment in order to be more effective.

Also, the results of Nourian *et al.*'s study in order to compare the two methods of virtual and traditional education in teaching dentistry showed that the mean score of students' academic progress in both virtual and traditional education groups was very similar, and no statistically significant difference was observed between them [12].

In another study that systematically reviewed studies related to electronic and traditional education from 1996 to 2004, 16 studies were examined. The results showed that in most of these studies, Internet continuous education had the same effect as the traditional method, and only in 6 studies, the Internet method was more effective than the traditional method [13].

On the other hand, the results of Rabiepoor *et al.*'s [14] study, with the aim of comparing the effectiveness of traditional and virtual education in learning fetal health assessment in midwifery students, showed that the mean score of the traditional education group was significantly higher than the virtual education group. In other words, new educational methods (virtual education) have not been able to fulfill the expectations related to learning more than the traditional method. In addition, the results showed that according to the mean scores obtained before and after training, the amount of learning of students in both virtual and traditional training groups increased significantly after participating in the relevant course [14].

In the present study, as in Rabiepoor's study, the mean performance score of students in the traditional education group was higher than in the virtual education group, but unlike Rabiepoor's study, this difference was not significant.

In a semi-experimental study, Rashidi Fakari *et al.* [15] compared the effect of traditional, web-based and simulation training on the clinical competence of midwifery students in the management of postpartum hemorrhage on 91 midwifery students. The results showed that the mean score of the students' clinical competence increased significantly one week after the training compared to before the

training in all three groups ($p < 0.001$); While the results of inter-group comparison did not show a statistically significant difference in the mean clinical competency scores one week after the intervention in the three groups ($p = 0.128$). In fact, all three teaching methods were equally effective in improving and learning the clinical competence of students, and these results are consistent with the results of the present study [15].

The results of the present study are not in line with the studies of Healy *et al.* [16], Moradi *et al.* [17] and, Soltani *et al.* [18].

In a prospective study, Healy *et al.* investigated the effect of e-learning on students' performance in doing surgical techniques. The results showed that virtual education along with traditional education was able to improve student performance and class ranking compared to traditional education alone [16]. The results of a review study by Moradi *et al.* [17] about the place of virtual education in the clinical education of rehabilitation fields showed that the use of virtual learning, online education, mobile learning, hybrid learning and simulator learning environment has positive results in improving the clinical skills and competence of rehabilitation science students. Virtual education as a complementary strategy to face-to-face education can play a role in the development of clinical education. Although it is not recommended to replace traditional education with virtual education, blended learning with a fundamental revision of the structure and learning method can be an effective way to improve the clinical education of rehabilitation students [17].

In their study, Soltani *et al.* [18] investigated the effect of targeted virtual training on the physical examination skills of internal medicine assistants on 11 first-year medical assistants in the academic year of 1997. The results showed that the average score of the assistants in seven Objective Structured Clinical Examination (OSCE) stations increased significantly after the intervention ($p < 0.001$), except for the chronic bronchitis station ($p = 0.243$), where no statistically significant difference was observed [18]. These findings are not consistent with the results of the present study, which could be due to the difference in the evaluation method of the study, as in the study of Soltani *et al.*, a group of internal assistants were assessed pre- and post-test, while in the present study, two groups of students were compared with two methods of traditional and virtual education.

Among the reasons for the difference between the results of the present study and the mentioned studies, we can mention the difference in the research community and the working methods of these studies and the present study. In most of the mentioned studies, virtual education was used as a supplement to traditional education, while in our study, virtual education was examined alone

compared to traditional education. Also, our study was conducted in the critical conditions of the spread of Covid-19 and the need to stay at home and the absence of students in universities, while these conditions did not exist in the mentioned studies.

According to the results of the present study, it can be said that the use of virtual systems is recommended due to the activeness of the learner in the matter of ability-based learning and the interactive nature of the training in medical sciences, although in many practical skills, using the traditional method along with virtual education can provide the basis for deepening the learned skills.

Therefore, it is necessary to adopt an evidence-based approach in education, because the possibility of practical training and skill acquisition for students in such conditions faces shortcomings. More research is needed to determine which virtual and online components can be effective in supporting the development of knowledge, skills, and clinical competencies in this regard.

The limitations of this research include the small sample size, the absence of a control group and comparison of virtual education with other conventional methods. Therefore, it is suggested to conduct studies comparing different educational methods with virtual education. Also, studies on the integration of virtual education with other educational methods and their comparison should be done.

Conclusion

Both traditional education and virtual education can be effective in students' learning, but traditional education in the clinical environment, especially for practical courses and clinical skills, can be somewhat more effective than virtual education alone. Therefore, it is better to use traditional education along with virtual education as a supplement in order to improve the level of practical skills training, especially in the fields of medical sciences.

Acknowledgements: We are extremely grateful for the support of the Vice-Chancellor of Education and the Research Council of Bojnurd University of Medical Sciences, as well as the students who participated in the study, the examiners and the staff of the practice unit and clinical skills center of Bojnurd.

Ethical Permission: Informed consent was obtained from all students to participate in the study.

Conflict of Interests: There is no conflict of interest

Authors' Contribution: Abassi Z. (First author), Introduction author (10%); Rashidi Fakari F. (Second author), Introduction author/ Methodologist/ Original researcher/ Statistical analyst/ Discussion author (28%); Rezaeean S.M. (Third author), Introduction author/ Discussion author (15%); Jazayeri Nezhad N. (Fourth author), Introduction author/ Methodologist/ Original researcher or Assistant/ Statistical analyst/ Discussion author (15%); Samadi S. (Fifth author), Introduction

author (5%); Khodabandeh F. (Sixth author), Introduction author/ Methodologist/ Original researcher/ Statistical analyst/ Discussion author (27%)

Funding: The present study was carried out with the financial support of the Research Vice-Chancellor of Bojnurd University of Medical Sciences.

References

- 1- Razavy SM, Salamati P, Shahgholi E, Honarmand M, Naderi F, Rahbarimanesh AA, et al. The effects of clinical skills learning centers on learning promotion among pediatrics Interns. *Iran J Med Educ.* 2011;10(4):430-8. [Persian]
- 2- Amini A, Barzegar M, Hatami Sadabadi F. The state of clinical competencies of medical students in performing basic clinical procedures at Tabriz University of Medical Sciences and Health Services. *Iran J Med Educ.* 2001;1(4):9-16. [Persian]
- 3- Dent JA, Hodges BD, Harden RM, Hunt D. A practical guide for medical teachers. 5th Edition. Elsevier; 2017.
- 4- Pakniat H, Movahed F, Dabagh T, Ghasemi Z. The effects of clinical skills training on medical trainees performances in gynecology ward of Qazvin University of Medical Sciences. *Res Med Educ.* 2012;4(1):9-16. [Persian]
- 5- Jafari F, Hakimian MR, Saburi M. What is the Clinical Skills Learning Center (CSLC)? *Iran J Med Educ.* 2001;1(3):21-9. [Persian]
- 6- Parsell GJ, Bligh J. The changing context of undergraduate medical education. *Postgrad Med Educ.* 1995;71(837):397-403.
- 7- Quail M, Brundage SB, Spitalnick J, Allen PJ, Beilby J. Student self-reported communication skills, knowledge and confidence across standardised patient, virtual and traditional clinical learning environments. *BMC Med Educ.* 2016;16:73.
- 8- Haghani F, Kamali FJJoME. Look at the clinical skills center and its applications. *Iran J Med Educ.* 2011;10(5):1068-76. [Persian]
- 9- Jeyakumar Y, Sharma D, Sirianni G, Nyhof-Young J, Otremba M, Leung FH. Limitations in virtual clinical skills education for medical students during COVID-19. *Can Med Educ J.* 2020;11(6):e165-6.
- 10- Healy DG, Fleming FJ, Gilhooley D, Felle P, Wood AE, Gorey T, et al. Electronic learning can facilitate student performance in undergraduate surgical education: a prospective observational study. *BMC Med Educ.* 2005;5:23.
- 11- Shahsavari Isfahani S, Mosallanejad L, Sobhanian S. The effect of virtual and traditional methods on students learning and competency-based skills. *Medical J Hormozgan Univ.* 2010;14(3):184-90. [Persian]
- 12- Nourian A, Nourian A, Ebnahmadi A, Akbarzadeh Baghban A, Khoshnevisan MH. Comparison of e-learning and traditional classroom instruction of dental public health for dental students of Shahid Beheshti Dental School. *J Dent Sch.* 2012;30(3):174-83. [Persian]
- 13- Wutoh R, Boren SA, Balas EA. eLearning: a review of Internet-based continuing medical education. *J Contin Educ Health Prof.* 2004;24(13):20-30.
- 14- Rabiepoor S, Khajeali N, Sadeghi E. Comparison of the effect of web-based education and traditional education on midwifery students for learning the lesson of fetus health. *Educ Strategy Med Sci.* 2016;9(1):8-15. [Persian]
- 15- Rashidi Fakari F, Kordi M, Mazloom SR, Khadivzadeh T, Tara M, Akhlaghi F. Comparing the effect of traditional, web based and simulation training on midwifery students' clinical competence in postpartum hemorrhage management. *J Mazandaran Univ Med Sci.* 2015;25(123):65-77. [Persian]
- 16- Healy DG, Fleming FJ, Gilhooley D, Felle P, Wood AE, Gorey T, et al. Electronic learning can facilitate student performance in undergraduate surgical education: a prospective observational study. *BMC Med Educ.* 2005;5:23.
- 17- Moradi N, Orakifar N, Hosseini M, Bostani H, Eslami K, et al. Status of virtual teaching in clinical education of rehabilitation fields: A narrative review. *Educ Dev Jundishapur.* 2021;12(2):363-73. [Persian]
- 18- Soltani M, Amini M, Milani N, Kalani N, Hashemzadeh K, et al. The effect of virtual distance learning on physical examination competency of internal medicine residents. *Horizon Med Educ Dev.* 2021;12(3):50-8. [Persian]