Original Article

Comparison of the Effectiveness of Video-assisted Teaching Program and Traditional Demonstration on Nursing Students Learning Skills of Performing Obstetrical Palpation

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Abstract

Background: Teaching methods have failed to keep up with the pace of the changing curriculum. Clinical practice, an essential part of nursing education, links theory with practice, particularly in midwifery nursing. Thus, this study aimed to compare the effects of video-assisted teaching programs and traditional demonstration on nursing students learning obstetrical palpation skills. **Materials and Methods:** This is a quasi-experimental research work with pretest, posttest, control group design in which 60 third-year students of Bachelor of Science in Nursing were selected and assigned randomly, by lottery method, into an experimental group (video-assisted teaching program) and a control group (traditional demonstration) regarding obstetrical palpation. The data were collected through a self-designed rating scale. The validity of the rating scale was established by a panel of seven experts from the field of obstetrical and gynecological nursing, and the reliability was established through Cronbach's α (0.78), which showed the tool was consistent among the population. **Results:** The results showed a significant difference between the pretest and posttest skill scores of students who were exposed to video-assisted teaching program and traditional demonstration ($t = 18.35$, $p < 0.001$). Although both the methods were equally effective in enhancing skill, traditional demonstration scored much better than the video-assisted teaching program when the posttest skills were compared ($t = 36.40$, $p = 0.001$). **Conclusions:** The routine educational method, i.e., demonstration, is more effective in developing skills emphasizing the reinforcement of academicians in enhancing teaching skills by adopting blended teaching technique for enhancing memory storage, retrieval, cognition, and learning.

Keywords: *Clinical competence, nursing, palpation, students, video–audio media*

Introduction

In the last few decades, nursing education in India has undergone tremendous change, from informal bedside hospital-based training to university-based graduate, postgraduate, and doctoral nursing education. Furthermore, the rapid growth and development in science and technology have largely influenced the need for improved methods of teaching–learning process to nurses in India. Nurses are actively involved in teaching patients, families, and communities as well as educating and training the new nurses. India has observed rapid growth and development in nursing education, resulting in an increased sense of responsibility among Indian nursing faculty to educate future nurses using educational technology so that they efficiently handle patient teaching, nursing education, and training. Therefore, the researcher felt a gap in the literature on pedagogy tailored to the peculiar needs of the teaching–learning process for nurses and nursing students among developing countries, in particular, India.[1,2]

Teaching is distinctively a human activity. Systematic attention to methods and materials of teaching and learning as well as mastery of the subject matter are essential for the development of artistic teaching.[1] The nursing curriculum includes various subjects to be taught in each year of the course. Obstetrical and midwifery nursing is one of the third-year subjects. The effective management of the antepartum and intrapartum periods is completely dependent on the accuracy of obstetrical assessment, including assessment of women's abdomen for fetal presentation,

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position, and wellbeing, which in turn helps in making early decisions regarding the place and mode of delivery.[2]

The nursing curriculum is continuously changing. Teaching methods have failed to keep up with the changing curriculum.[3] Bandura stated that the style of teaching preferred by a student is a reflection of his or her learning style.[4,5] The teaching of different skills requires various techniques and contemporary methods along with the traditional lecture method. Video-based education can be a suitable substitution when the demonstration method is unavailable.[6] One of the advantages of video-based education is that the voice of the broadcaster can be heard. Moreover, the figures, movements, illustrations used, and demonstrations presented can be seen.

According to Doijad and Kamble, animals were sacrificed regularly to show experimental physiology practical to first-year medical students. However, owing to certain ethical issues, ecosystem imbalance, and animal rights activists, there is a scarcity of animals for experimental use. Hence, they emphasized the need to introduce a new effective alternative teaching method to replace these animal experiments. In their study, they planned to find the better of two methods, video demonstration and live experimentation, on a small group (40 students) of first-year medical students. The students were taught experimental physiology by both the methods. The outcome was assessed in two ways, by comparing students' performance in a self-assessment question test with their perception toward the two methods by using the Likert scale. The result showed that the knowledge gained by both the methods was the same, but the perception of students toward video demonstration was better than that of live experimentation. Thus, the study concluded that students' response toward video demonstration as a novel teaching–learning method was excellent, and video demonstration can be a useful alternative to live experimentation for teaching experimental physiology to first-year medical students.[7]

One of the most important principles in education is adopting a teaching method in concordance with objectives, contents, and learners. Teaching and learning clinical skills are challenging aspects of education in the field of medicine and the allied health professions. Some of the new researchers have shown that video-based instruction has many advantages in comparison with other methods. But in the domain of the psychomotor learning, there is not enough evidence to show that video-based instruction is an effective teaching method.[8]

Yoo *et al*. (2010) conducted an experimental study on the effect of the video recording of Foley's catheterization to evaluate its effect on three outcomes: measures of the competency of procedure, communication skills, and learning motivation. The study was conducted through self-evaluation using a video recording of the Foley's catheterization of the students. The students in the experimental group (n = 20) evaluated their Foley's catheterization performance by reviewing video recordings, whereas students in the control group (n = 20) received written evaluation guidelines only. The results showed that the students in the experimental group had better scores on competency ($p < 0.001$), communication skills ($p < 0.001$), and learning motivation (p = 0.018) than the control group at the posttest, which was conducted 8 weeks after the pretest. The inference of the study indicates that self-awareness of one's performance developed by reviewing a videotape appears to increase the competency of clinical skills among nursing students.[9]

Several methods can be used to identify fetal position, presentation, attitude, engagement, and wellbeing. Methods such as ultrasonography, vaginal examination, and abdominal palpation can be used to identify position, presentation, attitude engagement, and wellbeing of fetus inside the mother's uterus.[10] However, ultrasonography is not cost-effective as the equipment is costly and its use requires expertise.[11] Vaginal examination, on the contrary, is only reliable when women are in established labor because its accuracy depends on dilatation and effacement of the cervix along with descent of the fetus presenting part.[9] This emphasizes the need for accurate obstetrical palpation that can be performed by the student nurses or registered nurses. It is noninvasive and does not require any equipment and can be performed by a trained nurse at any time of the day, establishing its popularity as the most feasible test of fetal wellbeing.[12,13]

The importance of obstetrical palpation in antenatal assessment is a globally acclaimed fact. As stated by Crede and Leopald in 1982, the four maneuver techniques in obstetrical palpation ensure identification of the fetal presentation, lie, attitude, position of different parts of the body, and wellbeing. Mak and Wong conducted a study and found that midwives had a favorable attitude toward obstetrical palpation but their confidence to practice was inadequate.[12]

Grant *et al.* evaluated the effect of videotape-facilitated human patient simulator (HPS) practice and guidance on clinical performance indicators among student nurses and anesthetists. The treatment group (n = 20) participated in HPS practice and guidance using videotape-facilitated debriefing, and the control group (n = 20) participated in HPS practice and guidance using oral debriefing alone. The result showed that students in the intervention group were significantly more likely to demonstrate desirable behaviors concerning patient identification, team communication, and vital signs. The role performed by the students in the simulation significantly impacted their performance. When scores of both the intervention and control groups were combined, team leaders, airway managers, and nurse anesthetists had higher mean total performance scores than crash cart managers, recorders, or medication nurses.

Thus video-facilitated simulation feedback is potentially a useful tool in increasing desirable clinical behaviors in a simulated environment.[13]

In the pressured environment of a classroom, if tools are not intuitive and simplified for the educator and student, they won't be used. However, the right technology will be quickly adopted by all. Every educator knows that delivery in a stimulating fashion, including visual input, can be key to learning in terms of understanding, application, and retention.[14,15]

The use of video in nursing education classes provides an easy, innovative, and user-friendly way to engage today's nursing students. Video presentations can be easily adapted into nursing courses at any level, whether a fundamental course for undergraduate students or a theoretical foundations course for graduate students. Increasingly, nursing students enter nursing programs experienced in the latest communication technologies and knowledgeable about various media offerings. Today, it is expected that nurse educators should use creative communication technologies to enrich the learning environment. Clinical practice is an essential part of nursing education which links theory with practice. Obstetrical palpation is one of the areas of clinical practice which demands accuracy and expertise that improve with the length of experience.[13,16,17] As today's student nurses are tomorrow's professional nurses who can contribute more in the field of treatment, educating these students and creating awareness, helping them to learn more about obstetrical palpation, will bring about positive outcomes in the future health indicators and quality of care. According to the famous saying, right practice is the safest investment toward hazard-free care, and right practice comes from right education.[15,16]

Materials and Methods

The study was quasi-experimental in design conducted with the objectives of assessing the effectiveness of video-assisted teaching program and traditional demonstration on obstetrical palpation among nursing students in experimental and control groups, to compare the effectiveness in terms of gain-in-skill scores in both groups and to find out the association between the pretest skill scores with selected variables.

In 2016, this study was conducted in the College of Nursing at Sikkim through quasi-experimental approach with pretest, posttest, nonequivalent control group design in two phases. In the first phase, the video-assisted teaching program was developed and research tools were prepared and tested for reliability and validity. In the second phase, the video-assisted teaching program and traditional demonstration were implemented concerning the provided rating scale. Also, the effects on the dependent variable of the study were reviewed. The Bachelor of Science (B.Sc.) in nursing program is a 4-year course with the obstetric and midwifery subject in the third year. These students have never been exposed to this subject before. Thus, for them, obstetrical palpation is a very new skill to learn. At first, all the nursing skills and procedures are demonstrated in a structured and well-equipped laboratory. Once the student is competent enough to perform the skill, they are posted to the clinical area. The sample included 60 nursing students who were currently enrolled in the fresh third-year B.Sc. in nursing program. The duration of the study was 3 months.

Some of the concepts were defined in the study. Skill was defined as the ability to perform obstetrical palpation, which includes the abdominal examination as measured by structured rating scale to have achieved the desired effect as evident from gain-in-skill scores. Obstetrical palpation refers to antenatal examination of a pregnant woman that consists of the following components: Palpation-fundal palpation—determines the presence of head or buttocks of the fetus; lateral palpation—determines the fetal back in order to determine position; pelvic-palpation-pelvic grip 1—determines the pole of the fetus; pelvic grip 2 (Pawlik's maneuver)—determines the engagement of fetal head;[16] and auscultation—a Pinards fetal stethoscope is used to hear the fetal heart sound.

The sample size (n = 60) was calculated using the formula for comparing averages, 95% safety factor, and statistical power of 80%. Among the 110 third-year B.Sc. nursing students, 60 students were randomly selected and assigned into experimental (n = 30) and control (n = 30) groups, respectively, through random allocation (drawing lottery). Two clinical teachers were selected randomly from the same college to select and assign the students to different groups to maintain the objectivity and homogeneity of the study.

The inclusion criteria were students who were available at the time of data collection, willing to participate, and who had not been exposed to any classes or demonstration on obstetrical palpation. The exclusion criteria of the study consisted of nursing students who were repeaters in the same class. The nursing students learning skill was evaluated by a structured rating scale on obstetrical palpation. The scale was given to five experts from obstetrics and gynecological nursing and community health nursing. The experts were chosen based on their clinical experience, expertise, and interest in the problem area. The reliability of the structured rating scale was tested using the inter-rater method by two raters. In the end, it ensured that the instrument used for measuring experimental variables gives the same results every time, hence showing the coefficient of equivalence among the test items.

The scale was divided into preparatory phase (eight items), abdominal palpation—fundal palpation (four items), lateral palpation (four items), first pelvic grip (eight items), second pelvic grip (six items), auscultation for fetal heart sound (three items), and termination phase (four items).

Each item in the scale is scored on a three-point rating scale with the scoring criteria of Perform (2), Somewhat perform (1), and Not perform (0) and a total score of 78.

After completing the background data form, before starting the intervention, the pretest skill of the students from both groups was assessed in maternal and child health nursing laboratory for one day by the researcher and one clinical instructor who completed the training session for obstetrical palpation. Each student from the group was asked to perform the obstetrical palpation and at the same time, the competency was assessed through the rating scale. The pretest/posttest design was selected because, in this college, students are frequently posted to OBG department for basic care in their first year of the nursing course. Hence to maintain the homogeneity, the pretest was performed among these students.

Subsequently, only a traditional demonstration on obstetrical palpation was conducted for students in the comparison group (n = 30) for 30 min in the maternal and child health nursing laboratory. The traditional demonstration is a routine teaching method adopted by nursing colleges for teaching any skill. Here, teaching of correct steps of obstetrical palpation on a pregnant simulator and adequate explanation by the investigator were adopted. Whereas the selected video-assisted teaching program for the experimental group (n = 30) was a prerecorded 22-min long video clip on steps of obstetrical palpation prepared by the investigator. The clip was shown using a laptop and speakers in a classroom setting on the same day.

After the intervention, the posttest observation and assessment in both groups were done on the 8th day in the maternal and child health nursing laboratory where each student performed the skill for 10–15 min. For analyzing data, paired t-test, independent t-test, and Chi-square tests were used. The statistical package used for data analysis and interpretation was IBM SPSS Statistics for windows, version 25.0 (IBM Corp., Armonk, New York).

Ethical Considerations

This study was approved by the SMIMS Institutional Ethics Committee (IEC) of the university with registration no.: IEC/419/16-02 dated May 3, 2016. All enrolled students signed an informed consent containing the clear data about the study, its purpose, and methods.

Results

Data analysis showed that the students in the traditional demonstration and video-assisted teaching program had identical variables such as age, type of residence, family income, previous academic performance, and previous experience in taking care of antenatal mother ($p > 0.05$) [Table 1].

Thus, based on the paired t-test result, there was a statistically significant difference within the group. This indicates that both the methods were found equally effective in enhancing the skill of nursing students in performing obstetrical palpation (t = 3.66, $p < 0.001$). Moreover, based on independent t-test results, there was no significant difference between the two groups in terms of overall mean pretest skill score (t = 0.41, $p > 0.05$) on obstetrical palpation before the intervention. This lack of difference was due to the random assignment of students in the two groups [Table 2].

However, the results [Tables 2 and 3] also showed that the overall mean posttest skill score of the nursing

Table 1: Comparison of sociodemographic characteristics between experimental and control groups

Groups	Control group Traditional demonstration		Experimental group Video-assisted teaching program		
Variables	*n* (%)	Chi-square	*n* (%)	Chi-square	*p*
Age (in years)		1.51		0.18	3.84, >0.05
18-20 years	17 (57)		18 (60)		
21-23 years	13 (43)		12 (40)		
Place of residence		0.69		0.43	5.99, >0.05
Nursing hostel	18 (60)		17 (56)		
Paying guest	1 (3)		2 (7)		
Rented/own house	11 (37)		11 (37)		
Family income		1.51		0.07	3.84, >0.05
Rs. <30,000/month	18 (60)		17 (57)		
Rs. ≥30,000/month	12 (40)		13 (43)		
Previous academic performance		0.84		3.07	5.99, >0.05
Not clear all subjects	5 (16)		5 (16)		
<50%	3 (10)		4 (13)		
>50-75%	22 (74)		21 (70)		
Previous experience in taking care of antenatal mother		1.26		0.53	3.84, >0.05
Yes	16 (53)		12 (40)		
No	14 (47)		18 (60)		

students on obstetrical palpation was higher in the traditional demonstration group (t = 36.40, p = 0.001) as compared to the video-assisted teaching program after the intervention (t = 18.35, p = 0.001).

Discussion

The study findings show that the posttest intervention scores were higher in the control group as compared with the experimental group indicating that traditional demonstration has more impact in improving the skill. The findings were consistent with a study of Karimi *et al.*,[17] where total learning skills in the demonstration method was more than in the video-based method.

The study findings also show that in the control group, the mean posttest skill score 55.13 (7.78) was higher than the mean pretest skill score 1.20 (1.54). The calculated paired t-test value (36.40) was also statistically significant. These findings are supported by Dash[18] who conducted a randomized clinical trial with pre- and posttest designs to assess the effectiveness of the video-assisted teaching module on contraceptive methods in Pondicherry among 977 couples. Dash's study suggested that there was significant improvement in posttest knowledge, attitude, and practice on contraceptive methods as compared with pretest and showed the effectiveness of the video-assisted teaching program.

The study findings show that the mean posttest skill score 37.70 (10.47) was higher than the mean pretest skill score of 2.23 (1.97), which was found significant by paired t-test value (18.35). The result indicates that there is a statistically significant increase in posttest skill. As already mentioned, this study shows that students learn more effectively using demonstration methods. A quasi-experimental study conducted by Gowri *et al.*[19] to compare and evaluate the effectiveness of web-based and traditional instructional methods to teach obstetrical palpation for antenatal mothers among B.Sc. nursing second-year students revealed that skill on obstetrical palpation was higher among students in the traditional group with a mean score of 27.87 (5.95) and standard error of mean 1.53.

Based on the findings of the analysis, there was no statistically significant association of the posttest knowledge scores of subjects with their selected sociodemographic variables such as age, type of residence, family monthly income, previous academic performance, and previous experience in taking care of antenatal women ($p > 0.05$).

These findings were supported by Midhula and Balasubramanian[20] who conducted a pre-experimental study to evaluate the video-assisted teaching module on the care of dementia patients among B.Sc. nursing students at Mangalore. The result revealed that there was no association between pretest skill and sociodemographic variables such as age, gender, academic performance, and previous experience.

A maternity nurse is an experienced and qualified specialist in providing essential support, advice, care, and respite to parents and new-born babies. Today, the public is very much aware of their rights and the consumer protection act that holds the maternity nurse accountable if any errors are made during antepartum, intrapartum, and postpartum period. Hence, nurse educators can use a variety of teaching–learning methods and styles in clinical settings to teach a nursing procedure that suits the nature of the students with the advancement in technology for best adaptation by the younger generation nurses. The nursing curricula should focus on the mixing of traditional instruction method with the modern teaching methods in clinical settings so that the students will benefit from the blended learning. Hence, teachers can use different teaching strategies to encourage critical thinking in students.

Table 2: Comparison of pretest and posttest skill scores on obstetrical palpation in two groups

Skill scores	Mean (SD)		Independent t-test	
	Control group	Experimental group	"t"	p
Pretest skill	1.20 (1.54)	2.23 (1.97)	0.41	>0.05
Posttest skill	55.13 (7.78)	37.70 (10.47)	3.66	<0.001
"t"	36.40	18.35		
Paired t-test, p=3.66	<0.001	<0.001		

Table 3: Comparison of pretest and posttest skill scores on subscales of obstetrical palpation between two groups

Area of skill	Mean (SD)		Independent t-test	
	Control group	Experimental group	"t"	p
Preparatory phase	50.75 (8.54)	39.10 (17.09)	1.03	>0.05
Abdominal palpation				
Fundal palpation	52.25 (6.75)	43.50 (20.35)	0.58	>0.05
Lateral palpation	53.25 (6.39)	47 (2.82)	4.40	<0.001
First pelvic grip	37.12 (20.60)	22.30 (19.50)	0.90	>0.05
Second pelvic grip	32.30 (18)	8.16 (3.60)	6.55	<0.001
Auscultation of fetal heart sound	53.66 (2.08)	30.30 (10.26)	6.03	<0.001
Termination phase	43.50 (10.60)	34.25 (16.60)	0.832	>0.05

Although the creation of video-based instructional materials takes time, the preparation of other teacher-made materials frequently used with students also takes time. Time-consuming editing of self-modeling tapes using a camera, laptops, computers, and VCR may become unnecessary as more professional video-editing equipment becomes readily available and affordable. Using this technology requires some practice.

This study has some limitations as it was conducted only in one college; hence, the findings cannot be generalized. The study was also limited to third-year B.Sc. nursing students with a limited subject.

Conclusion

Videos help to memorize the steps of palpation but may not allow for the sense of touch needed to identify the fetal parts. In a traditional demonstration, the teacher observed the fetal parts which enabled the students to understand better. There is no substitute for clinical demonstration; however, video-assisted teaching can be used as a supplement to the traditionally used bedside demonstration. Further research with multiple teaching methods can be conducted. The combination of instructional methods can be used to get a rich supply of learning opportunity.

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Conflict of interest

Nothing to declare.

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