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PROTOCOL STUDY FOR EFFECTIVENESS OF BLENDED LEARNING, VIDEO-BASED LEARNING AND FACE TO FACE LEARNING METHOD ON KNOWLEDGE AND SKILL OF MECHANISM OF LABOR AMONG UNDERGRADUATE NURSING STUDENTS AT SIKKIM MANIPAL COLLEGE OF NURSING, SIKKIM

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Abstract

Background: The range of educational resources now available to students has increased due to new technology. One of the difficulties and concerns in higher education, particularly in nursing education, is learning various practical skills. Teaching and learning about the typical process of labour is crucial for undergraduate nursing students who are studying midwifery and obstetrical nursing , the ability to articulate the typical process of labour must be learned by students. Basic knowledge of the regular mechanisms of labour is required for carrying out a normal vaginal birth. **Methods:** In order to compare the effectiveness of blended learning, video-based learning, and face-to-face learning methods on knowledge and skill of Mechanism of labour on undergraduate nursing students of Sikkim Manipal College of Nursing, Sikkim, this true experimental research approach study with pretest posttest control group design aims to test the primary outcomes. The secondary goal is to assess and compare the effectiveness of undergraduate nursing students' pre-clinical knowledge and skill score on mechanisms of labour, to assess and compare the effectiveness of their post-clinical knowledge and skill score on mechanisms of labour, and to determine whether their pre-clinical and post-clinical knowledge and skill scores on mechanisms of labour are related to baseline. The 93 undergraduate nursing students (31 in each group) will be assigned after a thorough assessment and a simple random sampling process. After the start of the fifth semester cohort (third year B Sc nursing), data collection will take place with informed consent. Both descriptive and inferential statistics will be used to analyze the data that have been collected. **Discussion:** Videos can make classes more exciting, but they cannot replace the need for tactile acquisition of practical skills. In a typical demonstration, the teacher watches the students and intervenes immediately if necessary. Traditional education has undoubtedly withstood the test of time and shouldn't be entirely replaced by more modern tools. Particularly in competency-based nursing education, we should concentrate on blending conventional and current teaching approaches so that students will gain from this approach. The study's findings will outline the most

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effective technique for instructing nursing students on the mechanics of labour, which will be used as support to start the best teaching learning methods.

Keywords: Mechanism of Labour, Nursing Students, Video Based Teaching, Traditional Demonstration, Midwifery Skill, Teaching Learning Methods

INTRODUCTION

Education has a main goal to achieve in societal aspects i.e., to increase the human potential in society, enhance human values and bring progressive transformation. Every nation on the planet invests in education to get skilled resources who can be leveraged as knowledge workers and global citizens and contribute to the nation's economy.[6] Growth in knowledge is directly proportional to the growth of being, what one knows creates an impact upon the quality of one's being. This eventually influences the nature and quality of knowledge, one possesses. Further overt behaviour is a manifestation of knowledge and thus the intricate web of life constitutes of what one knows and learning.[7]

"The issue of teaching techniques and the atmosphere in which instruction is offered is more crucial than the curriculum. The most important rule in education is to use a teaching strategy that unavoidably satisfies the fundamental criteria, such as objectives, material, and learners. Clinical practise, which was regarded as a crucial component throughout the educational process, enables nursing students to connect theory and practise in order to give patients with high-quality care. Students encounter difficulties and have issues during clinical practise, according to prior study.

The range of educational resources now available to pupils has increased due to new technology. One of the difficulties and concerns in higher education, particularly in nursing education, is learning various practical skills. Teaching and learning about the typical process of labour is crucial for undergraduate nursing students who are studying midwifery and obstetrical nursing. Nursing, the ability to articulate the typical process of labour must be learned by students. Basic knowledge of the regular mechanisms of labour is required for carrying out a normal vaginal birth. More nursing students are produced in India than anyplace else in the world. This was profoundly affected by the numerous private sector nursing schools.

In clinical settings, instructors can instruct a procedure or practise using a range of teaching and learning techniques. This ought to fit the kids' personalities. The younger generation's preferences should be taken into account as technology advances. Traditional education has undoubtedly withstood the test of time and shouldn't be entirely replaced by more modern tools. Particularly in competency-based nursing education, we should concentrate on blending conventional and current teaching approaches so that students will gain from this approach.

Blended learning is becoming a more and more common method of offering both synchronous and asynchronous instruction. Blended learning settings are generally understood to combine in-person instruction with technology-mediated instruction.

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Following the shift to online learning, a variety of educational settings have utilised tools including Zoom, Teams, Moodle, Blackboard, Flip Grid, and Google Meet, to mention a few. This could vary depending on the academic setting. Synchronous learning opportunities encourage teacher-student engagement in a virtual classroom when teaching in an online environment. Numerous studies have shown the benefits of synchronous online instruction, including enhanced learning, better communication, and strong group cohesion.

Significance of the study

Videos can make classes more exciting, but they cannot replace the need for tactile acquisition of practical skills. In a typical demonstration, the teacher watches the students and intervenes immediately if necessary. Another significant factor is the expertise and character of the teachers. The benefit of a traditional demonstration is that it may be stopped at any point and repeated as many times as necessary while being closely supervised until the student has mastered the required abilities. The clinical demonstration is indispensable. Teaching with videos is merely an addition to traditional demonstration. This is particularly true in bedside clinics because video demonstrations are increasingly taking the place of bedside clinics. Additional study using a variety of instructional techniques can be conducted to validate this.

In the future, a hybrid approach like that mentioned might work for everyone. The elimination of priceless conventional methods could result from the use of newer educational tools and accessories. Many students and senior professors do not agree that education has to change. The entire society, especially the patients, will suffer if we are unsuccessful in teaching students clinical skills.

OBJECTIVES

In order to compare the effectiveness of blended learning, video-based learning, and face-to-face learning methods on knowledge and skill of Mechanism of labour on undergraduate nursing students of Sikkim Manipal College of Nursing, Sikkim, this true experimental research approach study with pretest posttest control group design aims to test the primary outcomes. The secondary goal is to assess and compare the effectiveness of undergraduate nursing students' pre-clinical knowledge and skill score on mechanisms of labour, to assess and compare the effectiveness of their post-clinical knowledge and skill score on mechanisms of labour, and to determine whether their pre-clinical and post-clinical knowledge and skill scores on mechanisms of labour are related to baselin.

Research Question

Is there any difference in knowledge and skill of undergraduate nursing students on mechanism of labour taught through blended learning, video-based learning and face to face learning methods?

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Hypothesis

H_{01}**:** After using blended learning, video-based learning, and face-to-face learning methods, there is no discernible difference between the mean pre-test and post-test knowledge scores of labour mechanism among undergraduate nursing students.

H_{02}: After using blended learning, video-based learning, and face-to-face instruction, undergraduate nursing students' mean pre-test and post-test skill scores on mechanisms of labour did not significantly differ from each other.

H_{03}: Among undergraduate nursing students, there is no significant correlation between the pre-clinical and post-clinical knowledge and skill score of the mechanism of labour and certain baseline factors.

Operational definitions

1. **Effectiveness**: As far as the current study is concerned, it corresponds to the extent to which face to face learning method, blended learning method and video-based learning method on mechanism of labour has produced a desired effect on knowledge and skill of undergraduate nursing students in the preclinical and post clinical post test score as assessed by investigators developed structured tools.
2. **Three instructional methods:** In this study it refers to face to face learning method, blended learning method and video-based learning method.
3. **Face to face learning:** Instructional method given through traditional lecture and demonstration method on mechanism of labour by using dummy pelvis and fetal skull in MCH lab setting with one teacher and three sub-group of under graduate nursing students.
4. **Video based learning:** Instructional method given through pre-recorded video-based lecture and demonstration method on mechanism of labour by using dummy pelvis and fetal skull in classroom setting with investigator and under graduate nursing students.
5. **Blended learning:** Also known as face-to-face instruction in a regular classroom setting, blended learning refers to the educational practise of blending digital learning aids with UGC.

   A day before a face-to-face teaching session on the mechanism of labour with one teacher and three subgroups of undergrad nursing students in the MCH lab, the instruction will be delivered via pre-recorded video lecture and demonstration using a dummy pelvis and foetal skull and shared on the MS platform.
6. **Mechanism of labour:** Using a mock pelvis and foetal skull, this study describes the typical steps of the mechanism of labour. It will be carried out in the low-risk left occiput anterior position (LOA)**.**

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7. **Nursing students:** Who are currently enrolled in their third academic year of the B. Sc. Nursing programme for the 2020–24 batch at Sikkim Manipal College of Nursing, Sikkim, are used in the current study.
8. **Knowledge:** According to the researcher, this refers to undergraduate nursing students' accurate answers to ten multiple-choice questions (MCQs) on the mechanism of labour in order to assess knowledge and critical practical skills learned during the practical session as tested by a structured knowledge questionnaire.
9. **Skill:** The ability of nursing students to carry out the steps of the mechanism of labour as determined by a standardised rating scale is referred to as skill in the current study. OSCE will evaluate the pupils in three groups. The three groups will be evaluated independently by two blinded examiners using a rating scale, and each participant will receive an average score**.**
10. **Pre-clinical assessment:** In this study it refers to immediate assessment of knowledge and skill of undergraduate nursing students in post-test before their exposure to clinical field.
11. **Post-clinical assessment:** In this study it refers to post-test assessment of knowledge and skill of undergraduate nursing students after their exposure to clinical field.

Theoretical framework

Conceptualization is nothing but a structural method that encompasses ideas, designs and plans. Conceptual framework handles a compendium of concepts put together based on its relevance and research problems. This framework act as a reference for clinical practice, research as well as education. Conceptual models provide an overview on the topic of interest and project the assumptions made and philosophical views of the models. Conceptual model is composed of research design, data collection and interpretation of the findings.[34]

Conceptualization refers to the process of developing and refining abstract ideas. Conceptual framework is the focal point where different concepts or abstractions converge together based on its relevance to a common theme.[35]

The present study aims at planning, conducting and evaluating blended learning, video-based learning and face to face learning method on knowledge and skill of Mechanism of labor on undergraduate nursing students of Sikkim Manipal College of Nursing, Sikkim.

Albert Bandura' 'Social Cognitive Theory' (1962) was used as the theoretical framework in current study. Social cognitive theory is one such learning theory in which the ideas are generated when people observe others and learn from their actions in terms of social interactions, experiences, and outside media influences.

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In social cognitive theory, the learner is encouraged to

- Observe and imitate the behaviours of others
- See positive behaviours modeled and practiced
- Increase their own capability and confidence to implement new skills
- Gain positive attitudes about implementing new skills
- Get support from external forces so as to leverage new skills.[35]

The present study video is a typical example for this model that disseminates information on how undergraduate nursing student in this experiment re-enacted the model of mechanism of labour. They will be able to understand from the video which in turn aims the learner to practice mechanism of labour with correct technique as learned and avoid dangerous practices of doing mechanism of labour especially steps in performing.[12] Based on Social Cognitive Theory, the following factors influence the behavioural change of undergraduate nursing students on mechanism of labour.[36]

Environment: Bandura mention environment as social support factors that can affect a person's behaviour. The present study is inclusive of prerecorded video available online, followed by planned face to face classroom learning as well as the information retrieved from any class on similar topic previously attended, any previous experience with mechanism of labour, previous posting in OBG wards, and current area of clinical posting that would impact the personal factor and behavioural factor with regards to practicing the skill of mechanism of labour.[37,38]

Personal: Bandura mentions personal factor *to* the human beliefs, ideas and cognitive processes of a person which affect his behaviours. The personal factor in this study includes knowledge of mechanism of labour.[37,38]

Behaviour*:* Bandura refers it to the knowledge required to perform a given behaviours which promote mastery learning through skills training.

A person's behaviours are both influenced by a person's personal factors and the environment. In the present study behaviours factors are inclusive of practicing appropriate steps of mechanism of labour. The author intends to find the extent to which exposure to combined instructional method that is face to face and video-based learning brings change in knowledge and skill of the undergraduate nursing students on mechanism of labour.[37,38]

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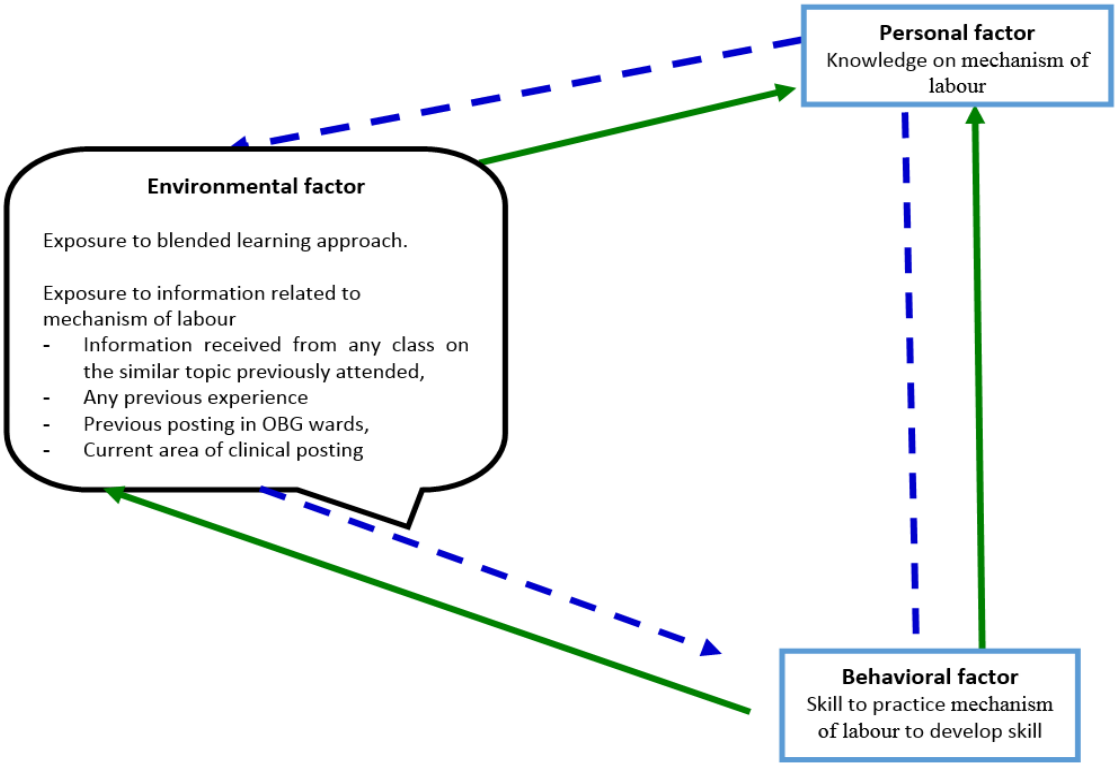

Figure 2: Conceptual framework based on Bandura 'social cognitive theory. (1962)

Methods & Procedures

Approach: Evaluative research approach.

Research design: This study is true experimental approach with pretest posttest control group design among two experimental groups and one control group with nursing students being individually allocated to either of the groups. The allocation ratio is 31:31:31 and is as follow:

Setting: Sikkim Manipal College of Nursing, Sikkim

Sampling Technique: Complete enumeration followed by Simple random sampling technique for assignment of the subject into three groups

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Groups	Pre clinical				Post Clinical
	Pre test Day 1	Intervention Day 2	Post test 1 Day 2	Post test 2 Day 8	Post test 3 26th Week
Face to face learning group (RC)	K1,O1	-	K2,O2	K3,O3	K4,O4
Video assisted learning group (RE1)	K1,O1	X1	K2,O2	K3,O3	K4,O4
Blended learning group (RE2)	K1,O1	X2	K2,O2	K3,O3	K4,O4

Figure 2 .Symbolic representation of pre test post test control group design

Key-

- K1- Pre-test assessment of knowledge among two experimental and one control group
- O1- Pre test observation of skill among two experimental and one control group
- K2,K3- Post-test assessment of knowledge among two experimental and one control group before exposure to clinical area
- O2,O2-Post-test observation of skill among two experimental and one control group before exposure to clinical area
- K4 - Post-test assessment of knowledge among two experimental and one control group after exposure to clinical area
- O4 - Post-test observation of skill among two experimental and one control group after exposure to clinical area
- X1- Administration of Video based learning method in Experimental group 1
- X2- Administration of blended learning method in Experimental group 2
- - Administration of face to face learning method in control group

Post Test 1 will be conducted soon after the administration of intervention so as to prevent the contamination of subjects with available online videos.

Sampling criteria

Inclusion criteria

- Students who are available at the time of data collection.
- Students who are willing to participate
- Did not receive a lecture or practical teaching on the assigned skill (i.e., mechanism of labour)

Exclusion criteria

- Repeater students in the same academic year.

Sampling Frame: Classroom Attendance register of 3rd year B Sc Nursing student (2020-24 Batch)

Sample size: 93 (31 each group)

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Sample size calculation

$$n = \frac{2\,(Z_{1-\alpha/2} + Z_{1-\beta})^2}{\Delta^2}$$

$$n = \frac{2\,(1.96 + 0.84)^2}{(0.8)^2}$$

$$= \frac{2\,(2.8)^2}{0.64}$$

$$= \frac{2 \times 7.84}{0.64}$$

$$= 15.68$$

$$\frac{}{0.64}$$

$$= 25$$

Taking 20% of the sample drop outs, mortality and attrition extra sample, thus 31 sample size will be considered for each group

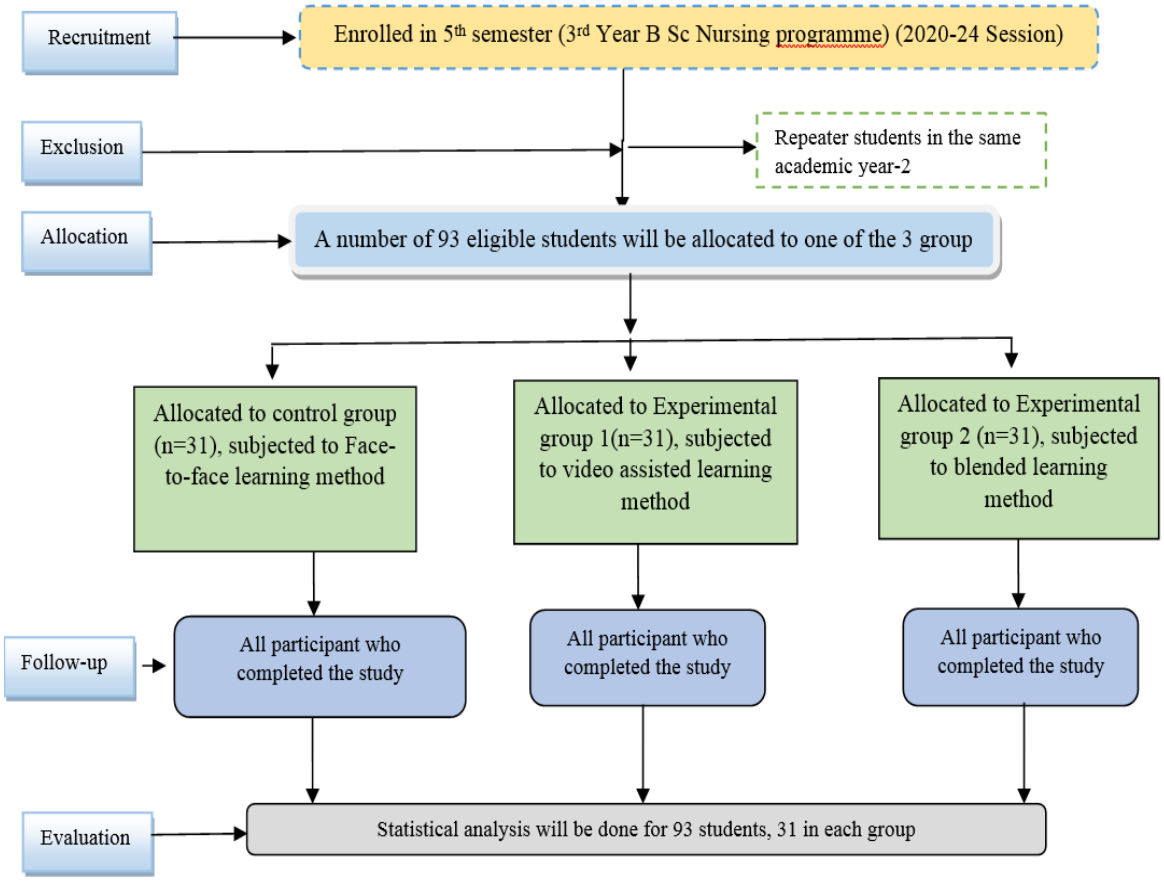

Figure 4: Flow chart for study participation

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Data Collection Plan

Table 1 shows plan for the data collection using the validated structured tool after giving the intervention to the experimental groups. lt starts from the l " day using the baseline measurement till 7 months of follow-up.

Table 1: Schematic representation for plan of data collection

Group	First day of menstruation	Pre Test	Pot test		
		Day 1	Day 2	Day 8	26th week
Face to face Learning group (RC)	Background information	√			
	Knowledge on mechanism of labour	√	√	√	√
	Skills in performing mechanism of labour	√	√	√	√
Video assisted learning group (RE_1)	Background information	√			
	Knowledge on mechanism of labour	√	√	√	√
	Skills in performing mechanism of labour	√	√	√	√
Blended learning group (RE_2)	Background information	√			
	Knowledge on mechanism of labour	√	√	√	√
	Skills in performing mechanism of labour	√	√	√	√

Ethical Consideration

1. Ethical Consideration will be obtained from the Institutional Ethics Committee.
2. An Official permission will be sought from the Principal, Sikkim Manipal College of Nursing.
3. Patient information sheet will be provided and Informed Consent will be obtained from all the participants.
4. Confidentiality of the participants will be ensured.
5. Participants will be assured that their participation is voluntary and they have the full right to withdraw from the study at any time without any penalty

Intervention Plan

Administrative approval and formal permission to be sought. According to inclusion criteria, the samples will be chosen for their eligibility for participating in the study. A sampling frame will be prepared and the students will be coded by numbers. A random method through envelop will be applied after explaining the purpose of the study to select and assign the participants in each group. Finally, a list to be prepared to keep the document of three groups subjects. Written informed consent to be taken from all subjects and personal background information will be collected.

The students will be divided according to random assignment into 3 groups with each group consisting of 30 students. The groups will be divided as experimental group 1 (Video assisted learning group), experimental group 2 (Blended learning group) and group 3 (control group- face to face learning group). Principal investigator will prepare the video recording regarding the skills on Mechanism of labour.

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On day 1, the consent will be taken from all the participants and pre-test on assessment of knowledge and pre-test observation of skill among two experimental and one control group will be done. On day 2, the students will be kept in separate lecture hall according to their specific group. The co- investigators (1,2)will be with group 1 Video assisted learning group in lecture hall 2 where they will display the pre-recorded video on Mechanism of labour. After the completion of video, the doubts will be cleared and post-test on assessment of knowledge will be conducted by co-investigator 1 and post-test on observation of skills will be done by other co-investigator 2.

The principal investigator will demonstrate hands on skills on mechanism of labour to group 2 blended learning group and group 3 control group- face to face learning group in lecture hall 3 and post-test will be done on assessment of knowledge by co-investigator 3 and post-test on observation of skills will be done by principal investigator for group 3.

After completion of hands-on skill by principal investigator for group 2, blended learning group, the students will be sent to lecture hall 1 where they will be showed pre-recorded videos on mechanism of labour and the post-test on assessment of knowledge will be conducted by co-investigator 4 and post-test on observation of skills will be done by principal investigator and co- investigator 2 respectively.

The second post-test on assessment of knowledge and post-test observation of skill among two experimental and one control group will be done on the 8^{th} day for recall of knowledge and skills on mechanism of labour. The third and final post-test on assessment of knowledge and post-test observation of skill among two experimental and one control group will be done on the 28^{th} day for delayed recall of knowledge and skills on mechanism of labour.

Statistical methods

The author will collect the data and analyzed the same to meet the research objectives. Both descriptive and inferential statistics will be used to establish the primary analysis of each group before intervention. After collecting the data, it will be analyzed utilizing descriptive statistics for Mean, Percentage, Frequency and Standard Deviation.

The primary outcome is the efficacy of three treatments on mechanism of labour through frequency, percentage, mean, SD, median and t test to see the difference within each group before and after the administration of each teaching method to three groups. The between the group comparison will be done through ANOVA. The long-term effectiveness of each treatment will be analyses through repeated measures ANOVA. The baseline influencing factor with outcome variable will be checked through chi square or fisher exact test. All analysis will be done through SPSS 21software.

Dissemination Plans

The result and findings of this research will be published in peer reviewed journals of general and specific interest and will be communicated to the other customer of research through oral a poster presentation at several platforms.

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Expected outcomes

Being a challenging task to accomplish in today's scenario, teaching practice demands one to exhibit highest professionalism. In nursing curricula, the study with regards to methods and approaches are closely linked with clinical nursing practices. Prior to their nursing practice upon patients, it is inevitable for a nursing student to know how to deliver care in a structured and appropriate manner. Further, they must get trained well to enhance their clinical skill performance in laboratory as well as in hospital setting. Nursing educators should introduce novel teaching methods to prepare the nursing students so that they can provide care to patients and apply the knowledge during clinical practice

After this study, the best teaching strategy can be implemented for the effective learning process during mechanism of labour. The effectiveness of blended learning or video-assisted learning method may assist students in bridging the gap between theory and clinical practice. The research result can be applied in the teaching and learning process to improve the nursing competencies in all aspect.

DISCUSSIONS

Knowledge, achievement, and competence - are the outcomes of any educational process that are expected of the learner, as well as everyone vested in the educational process. The most important way to improve their teaching is to develop the content with sophisticated levels of knowledge conveyed through the simplistic instructional methods. However good the content is, if not delivered in the simple way, it is not going to yield the expected results. So, alike the content, the importance must be provided to the way how it is disseminated to the target audience i.e., nursing students. Teaching methods and content being taught are dependent and closely linked with each other .[1,2]

According to a survey conducted by National Centre for Educational Statistics, most of the faculty members (around 83%) working in higher education institutions cited 'Lecture' as the most preferred method of instruction. Lecture is observed as a broad and direct transmission of factual knowledge to the intended audience. This instruction method enables the lecturers to develop class materials in custom and organized manner [3]

Hativa N suggested that, an effective traditional lecture and demonstration offer in-depth knowledge rather than just the dissemination of information, "it arouses interest and motivation, promotes concentration and attention, identifies and marks the most important information, and enables effective cognitive processing, storing, and information retrieval".[4]

The proliferation of nursing colleges in India has led to a bleak picture of nursing education due to the admission of students of poor motivation and of subpar quality, a lack of teachers trained in modern teaching-learning techniques, a severe lack of patients in many institutions, an unfavorable evaluation system, and a lack of practice during internships. Using a variety of methods and tactics is necessary while teaching diverse subjects and abilities. The method of instruction used by the instructor has a significant impact on how well students learn. In order to make up for the shortage of faculties and

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the lack of time, alternative methods of learning, such as video assisted teaching, have been developed recently.

The old process, according to Eliot C. W., a former president of Harvard, "pump laboriously into sieves. Even if the water is pure, it rushes through. A mind requires labour to develop.5

Dr. Wilbur Schramm examined 393 comparisons between video and traditional teaching techniques at colleges and universities. He claimed that by watching videos, 86% of them demonstrated at least the "same amount of learning," and 14% claimed to have learned "more."

60 third-years Bachelor of Science in nursing students were randomly divided into an experimental group (video assisted teaching programme) and a control group (conventional demonstration) for obstetrical palpation. Devi B. and Khandelwal B. Students in the video-assisted instruction programme greatly outperformed the traditional demonstration group on their pre- and post-test skill scores ($t = 18.35$, $p < 0.001$).

Through the use of both sound and vision, educational videos bring learning to life for viewers. Scaria, TM, and Valsaraj tested the effectiveness of video training over lecture or demonstration in enhancing knowledge and skill for antenatal examination of nursing students. They discovered that using videos to instruct the pupils effectively.

In a comparative study, Ramlogan S, Raman V, Sweet J, et al. assessed the knowledge and proficiency obtained by third-year dentistry students in three periodontology clinical activities by video and live lecture. Students preferred video and wanted that it be used in conjunction with the lecture rather than in place of the lecture. In a research on 80 undergraduate nursing students, ALCV was found to be more efficient than ALCD at teaching medication administration while using active lecture combined with demonstration (ALCD) and active lecture combined with video (ALCV).

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Availability of data and materials: Not applicable

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