

# Need of Simulation Based Learning in Obstetrical Practice to Address Inter Professional Education and Practice During Pandemic- A Study Protocol.

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## Abstract

**Background:** Pandemic has created a huge impact on learning and acquiring clinical skills. Simulation-based learning is one of the most efficient active learning techniques used to train diverse professionals. This involves the transfer of knowledge and skills from the training setup to the actual clinical environment and thus allows mastery of skill sets which results in improved patient outcomes. Thus Simulation-based learning keeps the clinical education on stream and also supports continual learning during the unprecedented situation, such as pandemics.

**Methodology:** Formulating an inter professional (IP) team of faculty including nurses, obstetricians, and neonatologist; and developing a Learning module using simulation is the primary objective. Following which interprofessional students from medicine and nursing disciplines will be identified and training workshop will be conducted. Pretesting will be done and the post-test scores will be compared after the workshop in terms of knowledge, skill, and clinical decision making of selected obstetrical skills.

Outcome measures (knowledge, skill and clinical decision making) will be assessed before and after the implementation of the module. Also, core IP competencies like teamwork & communication skills will be assessed during post test.

**Discussion:** Simulation-based learning has matured as an educational strategy. With early clinical exposure and outcome based education, it is very important to introduce the concepts of interprofessional education and practice among students. Also provides opportunities to lessen risks to patients and learners, enhances competence and confidence and reduces health care costs in the long run.

Trial registration: The study protocol is registered under Clinical Trials Registry-India (CTRI/2021/12/049675).

## Keywords

Inter-professional Education, Interdisciplinary team, Inter-professional communication, clinical competence, Simulation training.

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## Introduction

Learning is a process of acquiring new, or modifying existing knowledge, behavior, skills, values, or preferences. Purpose of teaching is to provide opportunities for learners to enable changes that facilitates the overall learning process.

In this modern era, education is a basic human right of every individual and lays strong foundation to pace social, political and economic development of the country. The conventional approach of teaching directs students to learn through memorization and recitation

techniques is replaced by constructivist approach of teaching like discussions, case based learning, problem-based learning, simulation-based learning which enhances learner's critical thinking, problem solving and decision making abilities, long-term knowl-

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edge retention, develops teamwork and interpersonal communication skills.<sup>1</sup> More recently tremendous advent of new technologies and skills in information technology has its own impact on the ways and means of living and also on education process, too. However, with the rapid progress in technology and the advancement in learning systems, it is now incorporated by everyone.<sup>2</sup>

Simulation based learning, one of the most efficient active learning technique is used to train diverse professionals. This involves the transfer of knowledge and skills from the training setup to the actual clinical environment. Also encourages the application of learned knowledge and skills in actual scenarios and thus allows mastery of skill sets which results in improved patient outcomes.<sup>3</sup> This technique of learning is unique as it allows learners to learn from their mistakes, which is considered a powerful educational experience and gives an opportunity to improve and excel.

It also provides learners with opportunity to develop and refine skills, repeatedly if necessary, using simulation technology without putting patients at risk.<sup>4</sup>

Simulation Based Mastery Learning (SBML) for lumbar puncture (LP), implemented on 58 internal medicine residents in their first postgraduate year proved that their procedural skills improved from a mean of 46.3% before SBML to 95.7% after SBML and recommended that these initiatives are distinctive and reflected as one of the influential educational tool that not only gives experience but also opportunity to develop.<sup>5</sup>

The Dynamic change in healthcare delivery requires collaboration and co-operation between various healthcare professionals. The World Health Organization (WHO) has recommended the introduction of Inter-professional Education (IPE) to address this demand. Inter-professional Education brings students together from different disciplines to learn from, with and about each other. This provides a means to promote and develop professional collaboration and equips students with skills required to practice in their later profession.<sup>6</sup>

A study revealed that when students from different professionals were trained together in an interprofessional educational setting during their course were more likely to be effective collaborators in their professional practice.<sup>7</sup> IPE also results in improving attitudes, collaborative knowledge, and team work.<sup>8</sup> Research done to find association between simulation and interprofessional collaboration revealed that interprofessional simulation education on shared leadership improved inter-professional care among students.<sup>9</sup>

Simulation-based learning as a newer pedagogy

approach trains undergraduate medical and nursing students in IP setting. This method of learning together will boost up their performance and confidence thereby reduces anxiety, making learner stress free, and self satisfied.<sup>10</sup>

Moreover, pandemic has created a huge impact on learning and acquiring clinical skills. Simulation based learning, is one of the most efficient active learning technique used to train diverse professionals. This involves the transfer of knowledge and skills from the training setup to the actual clinical environment. Also encourages the application of learned knowledge and skills in actual scenarios and thus allows mastery of skill sets which results in improved patient outcomes.<sup>11</sup> From the literature review it is evident that simulation-based learning keeps the clinical education on stream and supports continual learning in midst of this unprecedented situation. Therefore aim of the study is to assess the impact of learning module on knowledge, skill and clinical decision skills among undergraduate medicine and nursing students.

The objectives are to:

1. Develop an inter-professional simulated learning module on selected obstetrical skills
2. Assess the impact of module on knowledge, skill, clinical decision making of selected Obstetrical skills among undergraduate medicine and nursing graduates.
3. Evaluate teamwork & communication skills among undergraduate medicine and nursing graduates.

## Materials and Methods

**Study Design:** Quasi experimental pre-test post-test design

**Sample:** Final year medical and nursing undergraduate students studying at constituent units of selected professional colleges.

**Sample size:** 30 undergraduates at a ratio of 3nursing & 3medicine/ batch (6 students x 5batches)

**Sampling Technique:** Stratified Random sampling will be employed to recruit students form both the professional disciplines. Here strata is the professional course and students are selected randomly into two groups.

## Sampling criteria

- Final year medicine and nursing undergraduate students
- Willing to participate in the study
- Subjects who have never been exposed to obstetrics or neonatology

## Intervention

Interprofessional (IP) expert team which includes nurses, obstetricians, neonatologist will be formed.

Learning module using simulation will be developed by IP experts. IP participants will be selected based on stratified random sampling. IP training workshop (2-3 days) will be conducted for three days duration based on the students availability. Pretesting of outcome measures like knowledge, skill and clinical decision skills will be assessed before the implementation of the module. The module will be delivered to the participants through training sessions including interactive lectures, small group activities, case-based learning and simulation-based learning. The Inter-professional

education and practice concept along with core competencies will be introduced by IP experts during the session. Post-test assessment / evaluation will be facilitated by IP experts. The knowledge will be assessed by knowledge questionnaire while skills will be evaluated with Objective Structured Clinical Exam (OSCE). Performance Assessment for communication and Teamwork (PACT) scale is designed to measure the core Inter-professional competencies like teamwork & communication skills.

The study flow diagram is provided below in figure 1.

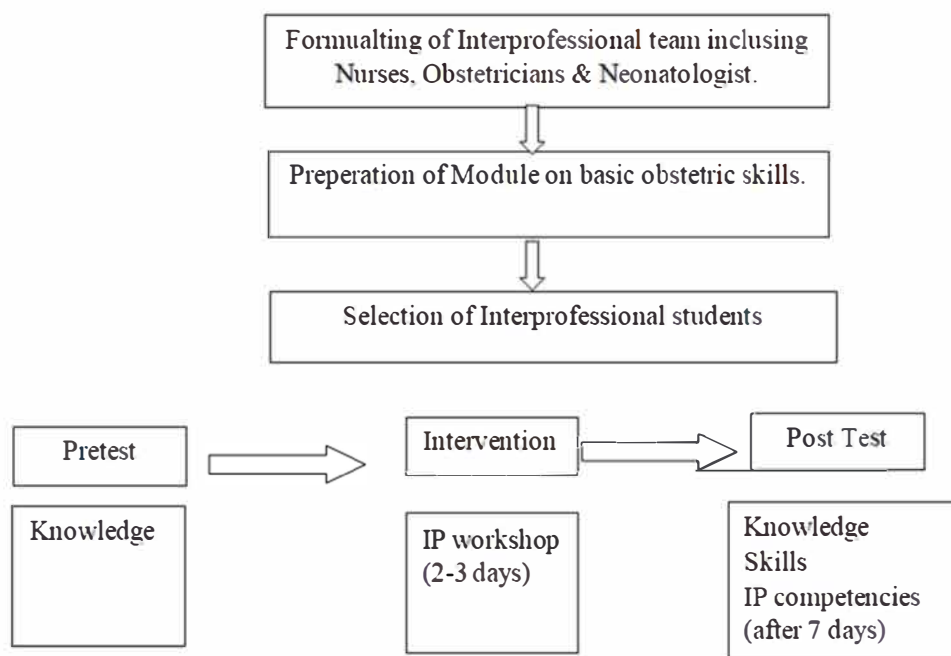


Figure 1: Flow Diagram of Study Design

### Data Collection Instruments

**1. Baseline Proforma:** To assess the baseline characteristics of inter-professional undergraduate students.

**2. Structured Knowledge questionnaire to assess the impact of SLOPE:** Include 30 items to assess knowledge under areas of normal labour, stages, physiology, immediate newborn care, newborn assessment. Score of one (1) is given for each correct answer and score of zero (0) is given for each incorrect option. The total score obtained was classified as good, average and poor knowledge. The tool was validated by a panel of multidisciplinary national experts who had assessed, reviewed, and had suggested modifications for the tool. The content experts who validated the tool were Neonatologists/Pediatricians, Obstetricians, Perinatal/Neonatal nurses and IP experts. The Scale-Content Validity index score was 0.95.

The tool was found to be reliable to use since the

correlation magnitude of accuracy was ( $r=0.85$ ) using split half method.

**3. Objective Structured Clinical Examination (OSCE):** Students performance and underpinning knowledge of clinical skills will be assessed. The areas of assessment are plotting and interpretation of partograph, active management of third stage of labour, essential newborn care. A checklist will be used to increase the objectivity and reliability of the assessment, and will be facilitated by IP faculty. A global rating score will assess student skill performance (12,13) (across the range "excellent/good/satisfactory/ borderline pass/borderline fail/fail").

**4. Performance Assessment Communication and Teamwork (PACT) Tool:** Is designed for students participating in team-based interprofessional training simulations. Consists of 5 instruments: two are self-report, pre-post assessments; and three are observational rating tools developed for raters with different

levels of experience (Novice to Expert). All five tools contain items that reflect the five domains of Team STEPPS: Team structure, Leadership, Situation monitoring, Mutual support, and Communication. The tools provide assessment feedback for learners, and evaluation information. The overall inter-rater reliability of the tool was good (Intraclass Correlation Coefficient (ICC) = 0.85).<sup>14</sup>

### Ethical considerations

The study protocol is approved by the Institutional review committee (IRC) of the institution. Ethical committee clearance for the study is obtained from the Institutional Ethics Committee (IEC 586/2021).

The trial is registered in the Clinical Trials Registry of India (CTRI/2021/12/049675) ([www.ctri.nic.in](http://www.ctri.nic.in)).

Informed consent will be obtained from the study participants.

### Data Analysis

Statistical analysis will be performed using SPSS software version 16. The data analysis will be done based on the objectives of the study. The sample characteristics are measured using descriptive statistics. Paired 't' test (based on normality of data) will be used to determine the effectiveness of simulation-based learning module on knowledge. Objective Structured Clinical Examination will be done to assess the skills using a predetermined checklist. A comparison of core IP competencies will be done using an independent t-test.

### Implication of the study

IPE produces future professionals for effective teamwork, a significant component for the person-centred, collaborative care.<sup>15</sup> Thompson et al concludes that Interprofessional education by a team of IP experts on geriatric care had a significant impact on teamwork and collaboration post-IPE (M=40.78, SD=4.05) than pre-IPE (M=34.59, SD=10.36).<sup>16</sup>

A study showed positive attitude scores among nursing and medical students towards inter-professional collaboration in wound care (mean 53.2, possible maximum = 60,  $p < 0.001$ ).<sup>17</sup>

Pooke in his study reported that medical students showed positive perception for developing inter-professional relationships with chiropractors and other professionals.<sup>15</sup> Online implementation of inter-professional case based learning motivated students in collaborative knowledge construction and improved team bonding among professionals.<sup>18</sup>

IPE-simulation is one of the most effective interventions that permit students to develop critical medical management skills and exhibit efficient team performance. It also provided more opportunities for improving competencies in inter-professional collaborative practice.<sup>19</sup>

### Importance of the proposed study Research

**Academic:** With early clinical exposure and outcome based education, it is very important to introduce the concepts of inter-professional education and practice among students. This collaborative approach facilitates towards improved healthcare outcomes for patients. The researcher is hoping that the module will be accepted among the health professionals and its implementation in the nursing and medicine classes.

**Practice:** This also helps the researcher to understand the extent of inter professional student and faculty engagement in learning activities which would in turn benefit the students, patients and society as whole.

### Conclusion

The pandemic has highlighted ways in which simulation-based techniques may improve organizational readiness and resilience, by meeting the rapid changes in clinical training needs, helping to shape the develop learning modules, thus providing a safe platform for learning. This inter-professional teaching module is different from existing curricular programs as it encompasses varied teaching learning activities like small group discussions, role plays, simulation which draws attention of students and makes their learning meaningful.

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