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# FORENSIC SKILLS LAB TO IMPROVE MEDICO-LEGAL SKILLS IN MEDICAL STUDENTS

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## ABSTRACT

**Background**: keeping the essentiality of medicolegal complexities in day-to-day practice, doctor should have forensic skills too as far as related to Medical field.

**Aim**: to compare score between Traditional and FMSL method, and to evaluate the effectiveness of module FMSL on students and faculty

**Methods**: Comprehensive lists of practical skills including all relevant psychomotor skills were assembled and reviewed; then checklists were developed concurrently with the development of each learning guide. All learning guides and checklists was peer-reviewed. Each guidelines contained a description of the exact steps and their proper sequence, needed by the learner to competently perform each skill. These steps correlated to the consensus of international best practices.

**Results**: After training in a skills lab, a notable change was seen. The FMSL approach has demonstrated a 30–70% improvement in scores, whereas the traditional method has demonstrated a 20–40% difference. Additionally, it was noted that training in FMSL improved practical skills more than training in the conventional manner. According to student feedback, they felt that the skills lab was helpful. Students enjoy the atmosphere, the facilitation, and the training of the facilitators in certain abilities.

**Conclusion**: Forensic Medicine Skills Lab are intended to train Indian medical graduates and can be suggested for use in medical education in a legal context in India.

**Keywords**: Cognitive, Forensic Skills Lab, Intellectual, Communication Skills, Practical Skills

## INTRODUCTION

Skills lab concept is introduced as compulsory requirement for clinical education. However Hence establishment of Forensic Medicine Skills Lab is an idea to improve understanding and get hands on training of medicolegal skills which can enable crowd management & avoid violence in emergency departments. According to NMC skills module document.[3], Skill is the ability to perform a task leading to a specific predefined outcome. Skill may be:

a) Intellectual or cognitive which includes clinical reasoning and decision-making skills,
b) Procedural or psychomotor skills that require manual dexterity and include laboratory and clinical skills,
c) Communication skills,
d) Team skills including leadership skills.

Competency is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, attitude, values, and reflection in daily practice for the benefit of the individual and the community being served.

Skill Assessment: A session that assesses the skill of the student including those in the laboratory, bed-side, skills lab, skills station that uses mannequins/ paper cases/simulated patients/real patients as the context demands.

DOAP (Demonstration -Observation - Assistance - Performance): A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently.

Skills Lab should be set to

a) Understand the link between competency and skill,
b) Enumerate the general principles of skill acquisition,
c) Explain how to apply these principles,
d) Understand the different methods and steps of skills teaching and acquisition (skill cycle),
e) Develop skill sessions from a given competency, and f) impart, assess and document the acquisition of these skills.

Regarding Linking of training through skills lab and practical clinical skills; Depending on the focus, examinations represent a specific learning incentive to acquire theoretical and practical knowledge or manually practical skills. The phenomenon known as "assessment drives learning" can be harnessed by creating congruence between the learning and examination format within the respective competence levels (knows, knows how; shows how; does; cf. Miller's Pyramid. Such "constructive alignment" is achieved, for example, if the set-up of a peripheral IV catheter is practiced in skills lab training (level "shows how") and the degree of competence acquired is then evaluated via a practical, not theoretical, examination on the same level of competency: hence, the examination format adequately corresponds with the learning level. It has been shown that skills lab training learning content relevant for OSCE examinations (objective structured clinical examination) was continuously and increasingly practiced during the semester itself[4]. Given the increase in simulation-based training opportunities in medical education, the question as to the effectiveness and transference of practiced skills in skills lab training arises.

to compare score between Traditional and FMSL method, and to evaluate the effectiveness of module FMSL on students and facult

To establish Forensic Medicine skills lab under department of Forensic Medicine & Toxicology & impart practical skills in simulated environment to enhance medicolegal skills of medical graduates after completion of Phase 3 MBBS

**MATERIAL & METHODS**

Forensic Medicine Skills lab was established in department of Forensic Medicine &Toxicology. Contextual construction of the content was validated by senior colleagues of Forensic Medicine and Medical Education Unit.

The proposed FMS Lab included following modules-

1. Biological Evidence Preservation: To do Preservation, labelling, dispatch of viscera and other biological tissues and fluids.
2. Moot court-to understand Medico-legal importance of evidence and witness.
3. Trauma center Simulating environment (Casualty) to learn Medico-legal duties with respect to patients with multiple injuries, Sexual Assault, Poisoning, Burn, etc.
4. Toxicology analysis-To diagnose common poisons by chemical tests and other means.

Teaching method –DOPS –After obtaining informed consent, Medico-legal practical skills was taught through FMSL in Phase 3 MBBS students after Pretest. For phase 3 MBBS batch was divided into 2 groups. While 1 group being imparted skills; another group acted as Control sample. Students will be assessed by OSPE based on skills. Results will be compared with control group of phase 3 students. In Another session, control group will be taught through skills lab. Feedback was taken from both batches after Questionnaire validation from expert reviewers. Data so obtained, was analyzed by statistical SPSS methods.

Educational Strategy- Team building and development of learning guides and checklist and educational videos was done for Faculties of Department for the construction of learning guides and check- lists according to internationally accepted methods[1].

Comprehensive lists of practical skills including all relevant psychomotor skills were assembled and reviewed; then checklists were developed concurrently with the development of each learning guide. All learning guides and checklists was peer-reviewed. Each guidelines contained a description of the exact steps and their proper sequence, needed by the learner to competently perform each skill. These steps correlated to the consensus of international best practices.

The learning guides enabled each student to chart his/her progress and to identify areas for improvement. The instructors provided feedback to the students regarding their progress and areas for improvements according to these checklists. The checklists also used as tools for assessment of the students' performance (competently performed, performed but not fully competent, not performed or incompetent).

***Training of instructors of FMSL***

Recruitment of dedicated Forensic Medicine & Toxicology staff members to run the lab was done & approved by HOD. All members were trained on so developed stations to teach the specified practical skills. Instructors were trained on how to work on simulators and solve any technical problem during training.

***The undergraduate course content***

A total of 8 teaching hours in skills lab allotted to be taught in skills lab marks were allocated for simulation based practical skills students' assessment.

***Running the training session***

The duration of each training session was 2 h. The practical training given After a brief theoretical presentation of the skills being taught (15% of allocated time). Students worked in teams of 10 members, Under facilitators with provision of corrective guidance. During this phase, the clinical instructor circulated between the teams, watching them, to see learning progress, to be sure that every student should have a chance to practice on the models and to make sure that all of them were following the steps of the guidelines, and respond to any question, concern, or issues. Students were asked to read learning guides before the session and to review specified web resources. During and at the end of all sessions, the students received focused feedback on their performance with documentation.

Feedback Questionnaires were developed by experts in medical education, the questions will be simple and direct, and the responses will be on a 5-point Likert scale: "strongly agree", "agree", "undecided', "disagree" and "strongly disagree". The aim of the questionnaire was to evaluate the extent to which FMSL met students' needs and expectations after first implementation. The anonymous questionnaires will be distributed at the end of the practical; they will fill on-site. Data was verified for completeness and computerized to analyses results.

**RESULTS**

Score difference between Pretest and Posttest was obtained for each module as shown in tables 1,2,3. There is significant difference observed after training in skills lab. Traditional method has shown 20 to 40 % difference while FMSL method shown 30 to 70 % improvement in scores. Also it was observed that practical skills were enhanced after training in FMSL more than traditional method. Feedback obtained from students show that they agree that skills lab was useful for them. They like facilitation, environment and facilitators' training on specific skills as shown in Fig 1 & 2.

| Score Difference between pretest & post-test | No of student | Score difference between pretest & post-test | No of students |
|---|---|---|---|
| 0% | 14(11.6%) | 0% | 3 |
| 1-2 | 9(7.5%) | 1-2 | 5(4.1%) |
| 3-10 | 4(3.3%) | 3-10 | 2(1.6%) |

| | | | |
|---|---|---|---|
| 11-20 | 25(20.8%) | 11-20 | 5(4.1%) |
| 21-30 | 27(22.5) | 21-30 | 15(12.5%) |
| 31-40 | 18(15%) | 31-40 | 22(18.3%) |
| 41-50 | 19(15.8%) | 41-50 | 25(20.8%) |
| 51-60 | 1(0.8%) | 51-60 | 21(17.5%) |
| >60 | 2(1.6%) | >60 | 11(9.1%) |
| 70% | 1(0.8%) | 70% | 11(9.1%) |
| Total | 120 | Total | 120 |

Table 1: Court room procedure SKILLS

| Traditional method | | DOPS after FMSL practical | |
|---|---|---|---|
| Score Difference between pretest & post-test | No of student | Score difference between pretest & post-test | No of students |
| 0% | 10(8.3%) | 0% | 6(5%) |
| 1-2 | 11(9.1%) | 1% | 3(2.5%) |
| 3-10 | 8(6.6%) | 2-10 | 1(0.8%) |
| 11-20 | 31(25.8%) | 11-20 | 16(13.3%) |
| 21-30 | 25(20.8%) | 21-30 | 12(10%) |
| 31-40 | 17(14.1%) | 31-40 | 18(15%) |
| 41-50 | 11(9.1%) | 41-50 | 33(27.5%) |
| 51-60 | 7(5.8%) | 51-60 | 17(14.1%) |
| | | 61-70 | 6(5%) |

| | | | |
|---|---|---|---|
| | | >70 | 8(6.6%) |
| Total | 120 | Total | 120 |

Table 2 Viscera preservation SKILLS

| Table 3 SKILLS OF Management of MLC in casualty | | | |
|---|---|---|---|
| Traditional method | | DOPS after FMSL practical | |
| Score Difference between pretest & post-test | No of student | Score difference between pretest & post-test | No of students |
| 0 | 18(15%) | 0 | 9 |
| 1-2 | 5(4.6%) | 1-20 | 7(5.8%) |
| 2-10 | 13(10.8%) | 21-30 | 11(9.8%) |
| 11-20 | 36(30%) | 31-40 | 20(16.6%) |
| 21-30 | 28(23.3%) | 41-50 | 17(14.1%) |
| 31-40 | 7(5.8%) | 51-60 | 25(20.8%) |
| 41-50 | 9(7.5%) | 61-70 | 18(15%) |
| 51-60 | 3(2.5%) | 71-80 | 9(7.5%) |
| >60 | 1(0.8%) | >80 | 4(3.3%) |
| Total | 120 | Total | 120 |

| | Table-4 Statistical significance- | | |
|---|---|---|---|
| Module | Practical Test Score | | |
| | Traditional Method | FMSL Method | P Value |
| | Mean±Sd | Mean±Sd | |
| Court Procedure | 5.55±1.01 | 7.42±1.27 | 0.002*** |
| MMLC | 5.28±1.08 | 7.49±1.40 | 0.001*** |
| VISARA | 5.27±1.12 | 7.39±1.33 | 0.001*** |
| *** Highly significant as p value <1% | | | |

**DISCUSSION**

Remmen et al. (1999) demonstrated that medical students' ability to perform skills independently in routine clinical practice enhanced as a result of training in skills laboratories. Jünger et al. conducted prospective research in 2005 to examine how students' performance on the OSCE test was affected by basic practical internal medicine skill training, which included seven units of 90-minute skill lab instruction. Compared to the control group, who had just received traditional bedside instruction, the intervention group did noticeably better on the OSCE assessment. Lund et al. (2012) demonstrated that skills lab training resulted in both an objective and noticeably greater rated transfer capacity for clinical abilities learned in skills lab training, as well as enhanced examination performance in real-world clinical trials. The research group led by Cook and colleagues contributed several important meta- analysis to assess the effectiveness simulation-based training in medicine: in 2011, Cook et al. were able to show that simulation-based interventions were superior to no intervention settings, stressing that no further primary studies of this kind would be necessary as the large effect sizes in the areas of knowledge, attitude and skills and moderate effects on patient care outcome had been clearly proven for simulation-based training. In 2012, in a further meta-analysis, Cook and colleagues examined the superiority of simulation-based training in medicine over other instruction

methods and could substantiate small to moderate effects over training forms which had dispensed simulation use. Skills-Lab's training efficiency is debated as per cost incurred.[4]

Forensic Skills Lab has been Established to link between Goals to be achieved through Didactic, practicals and skills. It will enhance TL process to produce Medico-legal skills in IMG. While Teaching in Dept of Forensic Medicine &Toxicology, following Objectives have been fulfilled [2] including: to define the Medico-legal responsibilities of a general physician while rendering community service either in rural primary health center or an urban health center.

To Appreciate the physician's responsibilities in criminal matters and respect for the codes of medical ethics. To diagnose, manage and identify of common acute and chronic poisonings and also its legal aspects. To describe the Medico legal aspects and findings of postmortem examination in cases of death due to common unnatural conditions and poisonings. To detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspect particularly pertaining to workmen's compression act.

## CONCLUSION

Forensic Medicine Skills lab has given the outcome expected to impart skill in Indian medical graduate and can be recommended to implement in Medical Education in Indian Legal setting.

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