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Effectiveness of modular training programme in imparting first-AID training skills among undergraduate medical students- a qualitative research

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Abstract
Background: In undergraduate curriculum, first aid training is conspicuously neglected. Vision 2015 of the MCI emphasizes competency based medical education where integration of fragmented disciplines needs to be focused and achieved by a modular training. In this research we studied the effectiveness of such an intervention.
Objectives
- To assess the effectiveness of modular training programme in first aid skills.
- To compare the various teaching/learning and assessment methods in training.

Material and methods: An interventional study done at Medical Education Unit of GVMCH on 196 final MBBS students between June 2017 to July 2018. This training was subdivided into 7 modules, namely Introduction, Shock/Burns, Poison Management, Disaster management, BLS, Orthopaedic Emergencies and TAEI. The effectiveness of the modular training programme was evaluated by student's response using feedback questionnaires. The different teaching/learning methods and assessment were evaluated by Likert rating scale.
Results: 99% of participants agreed that the overall quality of the programme which include practical value, study materials, speakers, public health settings was good [$p<0.0005$]. 72.5% found that innovative modular teaching learning methods (CBD, PBL, Role play, Small group discussion) was effective when compared with conventional teaching learning methods in improving first aid skills[$p<0.0005$]. Individually modules 4 and 7[Lectures] were considered less effective by students. Comparison of assessment methods showed 97.2% fared well in OSCE whereas only 71.9% did well in MCQ pattern.
Conclusion: Modular training in tackling emergencies is very effective in enhancing the skills of Medical Students.

Keywords: modular, comparison, assessment, overall, role play

1. Introduction
The rate of incidence of medical emergencies have alarmingly increased in the recent years. The reports from the World Health Organization (WHO) state that more than 1.24 million people are killed on the world's roads every year. Annually, about 50 million people are injured in road crashes across the globe. In developing countries like India, there are about 70 percent of the fatalities are witnessed posing a serious social and economic challenges. (Vasudevan et al) The component of first aid skills includes CPR, initial dealing of orthopedic cases, back and neck injuries, toxic chemicals and poisoning, and all burn types. A competent knowledge is mandatory for the management of an emergency without a hospital setting at the spot of the accident or emergency which is unsatisfactory as most medical schools do not possess a proper first aid training in their existing teaching curriculum. To ensure the effective management of such situations by the medical professionals, an adequate training is a basic necessity. (joseph et al).
Training of medical professionals since their undergraduate levels will make them expertise in the field of emergency care especially in a country like India were the lack of knowledge and skills regarding the appropriate first-aid skills and action (competent) towards injuries and illnesses. A competent knowledge and communication skill is mandatory for the management of an emergency without a hospital setting i.e., at the spot of the accident or emergency, which is unsatisfactory as most medical schools do not possess a proper first aid training in their existing teaching curriculum as the integrated hands on training by multiple departments are improper and due to under knowledge in basic sciences. If properly groomed and educated, students can change the health scenario of the society. Hence, there is a need for a definitive intensive education on various aspects of first-aid skills to students from the first year of medical school to their final semester (Goel et al) Enlightening the medical students at the undergraduate level regarding various aspects of primary aid to mitigate the deliberate repercussions of accidents. The mortality rates would decline if there is an increased focus on safety strategies in emergency and public awareness as this has a direct impact in improving the health care system.
The present medical education system is facing with daunting challenges. Although the lavish investment of significant resources by governments and regulatory bodies worldwide to subsidize medical training, the physicians continue to enter the workforce lacking skills in inter-professional teamwork, information management, quality improvement and basic surgical skills. Due to the imbalance of physician specialty choices along with the geographic

maldistribution of practicing clinicians' results in reduced accessibility to the basic health care services for the patients. There is undoubted need for a fundamental reform in medical education as the outcomes of such problems have led us to conclude that the existing medical education hasn't completely met the health care requirements of the patients, populations and society. (caverzagie et al)

Considering the present situations, where in one hand the effective requirement of medical help during emergency is much sorted and on the other hand, the future medical professionals with inadequate knowledge and improper skills in handling emergencies, this study aimed to provide the undergraduate medical students to analyze their skills and provide them with adequate knowledge by innovative modular training programme found on competency based medical education. The objectives of the study were to assess the effectiveness of modular training programme for first aid skills and to compare various teaching and learning methodology in first aid skills training through possible assessment methods.

Validity and reliability are considered when developing any method of assessment. Recently, the focus is turned upon competencies rather than on knowledge acquisition in medical graduates. Competency is defined as a complex set of behaviors built on the components of knowledge, skills and attitudes. The salient feature of the medical curriculum 2012 is the emphasis on learning which is competency based, integrated and student-centered acquisition of skills and ethical and humanistic values. The teaching and learning process is aligned and integrated across specialties both vertically and horizontally for better student comprehension by introducing student centered learning methods.

Methodology

This modular training was prepared by a team of experts from various specialties such as- Internal Medicine, Orthopedic Surgery, General Surgery and Trauma Care Medical Officers. The opinions from the experts of the curriculum designing committee was taken into consideration and the study material inclusive of assessment techniques was prepared for a duration of 3 months, which was then approved by the Academic Officer. The clearance from the Institutional Ethical Committee was also obtained before proceeding with the course of the study.

One of the finest attempts at measuring clinical competency is use of the Objective Structured Clinical Examination (OSCE) method. It is the only tool that could identify the students who have the best clinical skills and medical attitudes. It is encouraged that the use of OSCE or a similar method combined with other methods of evaluation for adequate assessment of medical students will turn out to be fruitful.

Table-1: Teaching learning methods and assessment methods of the various modules

Topic	Duration	Teaching and Learning methods	Assessment method
Module 1 - Introduction about FAST & small techniques	2 hours	Small group discussion	OSCE
Module 2 - Shock and burns	2 hours	Lecture	MCQ
Module 3 - Basic life support	3.5 hours	Small group discussion	OSCE
Module 4 - Disaster management and Triage	1 hour	Lecture	MCQ
Module 5 - Approach to coma and poisoning	2 hours	Case based discussion	Problem solving questions
Module 6 - Orthopaedic management	3 hours	Role play	OSCE

This interventional study included 196 final year undergraduate medical students into four groups, who attended the first aid skills training (FAST) workshop between June 2017 to July 2018 in the Medical Education Unit, Government Villupuram Medical College and Hospital. The objectives were accomplished by conducting 6 different modules regarding first aid skills by innovative teaching-learning methods and assessed accordingly to ensure the effectiveness of competency based medical education. (Table 1) The effect of the Modular training programme was evaluated by student's response by feedback questionnaires with Likert rating scale from 1 to 7 (Strongly Disagree to Strongly Agree). Planning and execution of the modules were accomplished by the medical education unit, with the help of doctors from various departments of the institution including the clinical and pre-clinical departments in order to establish specialization from various aspects and situation. Validation from the Curriculum committee was also obtained regarding the effectiveness and efficiency of the modules in order maintain the standards of the programme. During the programme different teaching learning methods used which was also evaluated by Likert rating scale. The study population competency was assessed in three domains, namely- attitude, knowledge and psychomotor skills, by various assessment methods including- Multiple choice questioning (MCQ), Problem solving questioning and OSCE.

Results

The results showed that 99% of participants agreed that the overall quality of the programme which included practical value, study materials, speakers, public health settings was good [$p<0.0005$]. (figure.1). And,72.5% found that innovative modular teaching learning methods were effective when compared with conventional teaching learning methods in improving first aid skills [$p<0.0005$] (figure 2). Comparison of assessment methods showed 97.2% fared well in OSCE (>60%) whereas only 71.9% did well in MCQ pattern.

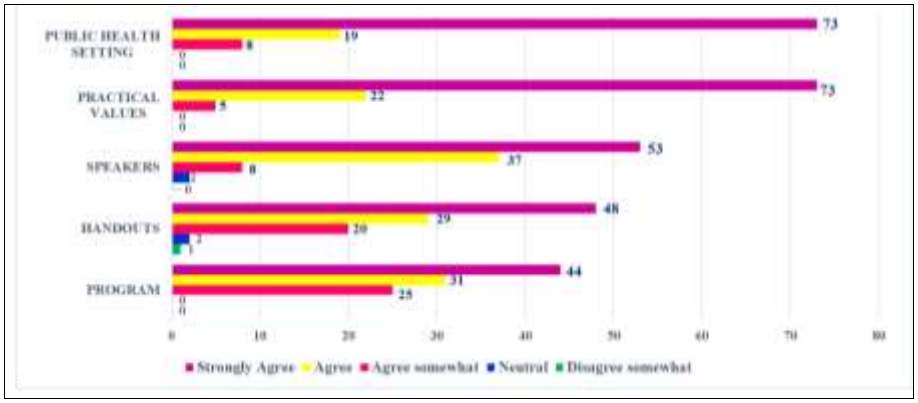

Fig 1: Analysis of modular training programme evaluation

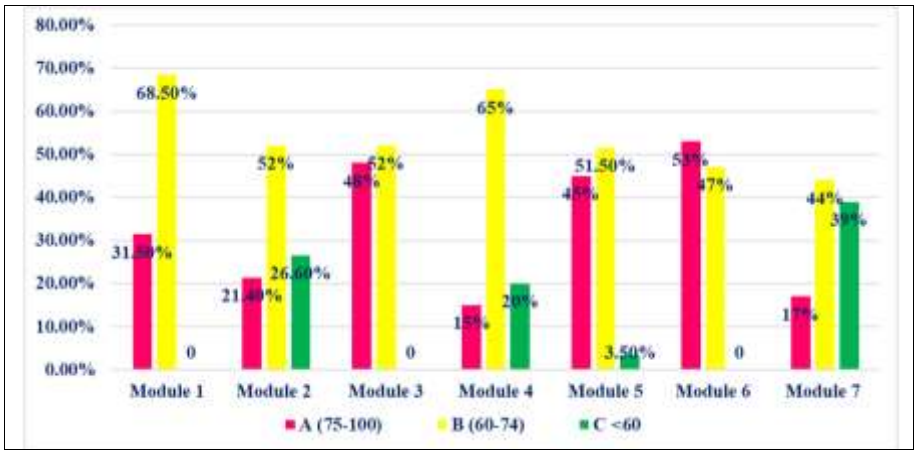

Fig 2: Comparision of Training efficacy among various Modules

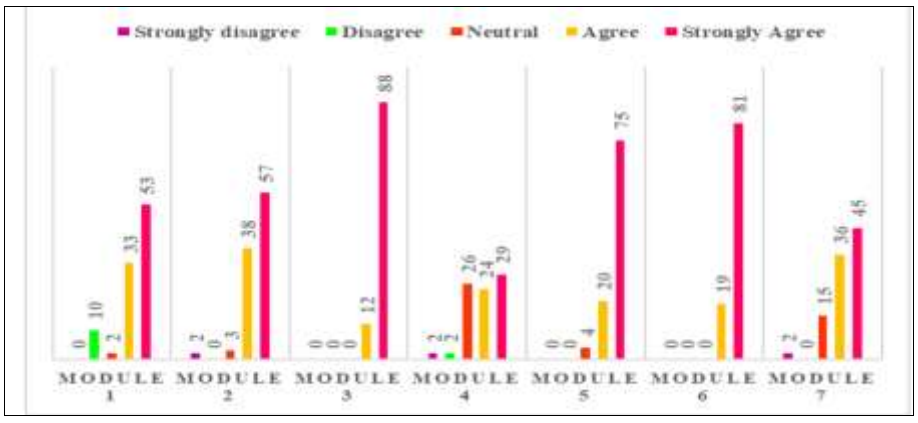

Fig 3: Comparison of teaching efficacy among various modules

Discussion

The results are not surprising as the students showed effective performance in the assessment done with the help of OSCE as suggested by Santos et al that among multiple choice and open questions, OSCE, interviews, curriculum analyses for participation in scientific meetings, papers published and voluntary activities, OSCE alone was able to differentiate candidates for residency that had a clerkship duration of 2 years or less10. This finding is not surprising since OSCE evaluates competency, and a longer clinical medical education (internship) will improve skills and attitudes. Caverzagie et al said that in a Competency Based Medical Education (CBME) system, curricula and assessments are driven by predefined outcomes and competencies. Students are expected to demonstrate achievement of these outcomes before moving to the next step of training. CBME is in contrast to historical curricular frameworks in which knowledge acquisition, validated through psychometric testing, in conjunction with clinical exposure over a predetermined period of training, was deemed sufficient for advancement. And also, the effectiveness of learning and acquiring skills are high in CBME when compared to the usual ways of teaching, supporting this study completely where, 97.2% students have shown exemplary performance in OSCE assessment.

The current study showed a higher gain in knowledge with modular method of learning compared with didactic teaching. Earlier study by Srikanth et al. that experimented with modular teaching for the topic acute respiratory infections among children found that the mean posttest score was higher in the modular group compared to lecture group. Soudarssanane and Singh, although not terming it as

modular teaching, also documented effectiveness of using a mix of handout combined with video clips and participatory discussions in learning for undergraduate students in India way back in 1994.

The students' feedback suggested that for all the methods they found the sessions to be interesting and the contents to be well organized. Furthermore, students from all the groups expressed that they were given opportunity to ask questions. This may be teacher specific and likely to be changed for a different teacher. An important finding was that a larger proportion of students in modular method reported that they were actively involved in learning, which meant that the modular method served its purpose. Each student had to read a portion of the module as per their turn which ensured their active involvement. For this study, we kept the turns by roll number of students but it was suggested to keep it as per random numbers to keep an element of surprise and increase the attention.

Moreover, a significantly larger proportion of students asserted that they were confident to manage an actual case of poisoning among the modular group compared to didactic one. Making the students solve clinical exercises at the end and making them write the answers in the module was probably helpful in achieving this learning at “knows how” level in cognitive domain.

The modular learning may not be a new concept among the medical educationists. However, it has not been used as commonly. Lately, with the renewed interest there are publications which report experimentation with modular teaching–learning for undergraduate medical students from various subject specialties.

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