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Effective training of II MBBS students on research methodology: A pilot study

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Abstract
Background: MBBS students have minimal if any exposure to research. We aimed to develop research capabilities in the MBBS student. Research training to MBBS students is insufficient and warrants Rewamp.
Objectives
- To sensitize the II MBBS students about Research Methodology.
- To educate the target population in the proper usage of Information Technology.
- To enable the participants to write a research protocol.

Methodology: This was a prospective intervention study conducted between October'17 to Jan'18. The study was done on 96 II MBBS at Medical Education Unit by the curriculum committee from our college.
- Sensitization programme one day and workshop on research methodology - 2days.
- Proposal submission by students – 15 days (based on ICMR STSS Guidelines).

The outcome of the study was assessed by way of Pre and Posttest questionnares by the participants' response. Three domains were considered, namely Attitude, Knowledge and Barrier about research methodology.
Results The awareness about research rose from 47.5% to 86.7% and preparedness from 13.3% to 90.5% post programme [p<0.001]. In knowledge domain, there was a twofold rise[20% vs 82%]from baseline. Assessment of the attitudinal change revealed that 97% accepted the importance of research. The noteworthy barriers were funding (45%), time constraints(63%)language(39%),guidance(66%). Postworkshop ICMR STSS project participation of IIMBBS compared with the previous year [15% in 2018 vs 3% in 2017].
Conclusion: MBBS Students have genuine interest and aptitude for research which could be enhanced by structure training. We recommend that research should be an integral part of the curriculum.

Keywords: Postworkshop, MBBS, training, research, methodology

1. Introduction
Research is defined as "the systematic investigation or detailed study process to discover and understand new information that would modify, initiate or terminate present concepts particularly in the medical field. Health related medical research broadly classified into biomedical research, epidemiological studies and health services research include social, behavioral, economic factors that affect health.
Health research has high value in the society. WHO has recommended that field oriented research is an important component of Community Medicine[1]. Field based research is important component of the training in community medicine in all countries. Worldwide, it is being increasingly recognized that scholarly activity programmes are essential components of the modern undergraduate medical curriculum [2]. Medical research at undergardaute level has been given poor importance in developing countries including India [3].
Undergraduate medical students have little if any exposure to research in their present curriculum. If research-oriented training is imparted to the medical student it will enhance concept formation. In the developed nations inclusion of research component as part of the curriculum has been established [4, 5]. In current Undergraduate MBBS syllabus experimental epidemiology is a part of curriculum.

Needs of research methodology training for undergraduate
1. According to new curriculum in India core competency of medical graduate is lifelong learner, graduates must be able to 'critically evaluate evidence' and 'use research skills to develop greater understanding and to influence their practice' [6]
2. It is mandatory for Medical students to take part in either elective postings or extracurricular activites according to the new MCI Curriculum 2019 [7]
3. Research experience may also boost self-confidence, career profile of graduating medical students
4. Actually, helps to develop basic and in-depth knowledge and better understand the particular field which may student centred, community oriented self-directed learning [8]
5. Can develop the information literacy, critical thinking skills, diagnostics reasoning.
6. Research provides mentorship [8].
7. Improve their curriculum vitae, survey of undergraduate's researchers found 75% were motivated

to pursue further research and 60% aspired to a full-time academic career [9].

However, the student participation here is merely at the level of data collection which would not enable higher order thinking process. We addressed this issue by imparting research training to the II MBBS student studied the aftermath. Aim of our study to develop research capacity among Undergraduate Medical Students.

Objectives

- To sensitize the II MBBS students about Research Methodology (RM).
- To educate the II MBBS students in the proper usage of Information Technology.
- To enable II MBBS students to write a research protocol.

Methodology

The Prospective Intervention study were conducted by Medical Education Unit, Government Villupuram Medical College Hospital, Villupuram between October 2017 to Jan 2018, after Institutional Ethics Committee approval. It was involved following series of structured training sessions to sensitize, develop and improve the research skills of 96 II MBBS students.

- Sensitization programme - 1 day. (Phase I)
- Workshop on research methodology (RM) – 2 days. (Phase II)
- Proposal submission by students – 15 days (based on ICMR STSS Guidelines).

This was achieved by interactive teaching sessions, workshop and Self-Directed Learning. The students were guided and supervised in their project activity which mandated them to draw research protocols in their respective field of interest. A validated questionnaire was compiled by the investigators.

Evaluation

- During the sensitization programme the student response was assessed by way of Pre and Posttest questionnaires.
- The response of the study population was assessed in three domains, namely- attitude**,** knowledge and barrier concerns. The data was analyzed using standard statistical software.

Results

A total of 96 second year MBBS students participated in the study. The following results were documented:

- There was a statistically significant increase [Z test $p<0.001$] in awareness, knowledge and preparedness after the phase I sensitization programme [Table 1].
- In phase II intervention the following aspects of research capability were assessed, namely:- knowledge, attitude and barriers. The results revealed that in the phase II training 97%, were agreed research methodology is an important for our medical professional.
- 93% students were agreed their knowledge after the training improved and 43% students agreed research methodology can be part of assessment.(Figure.1)
- In the barrier aspects 63%,66% students were agreed that doing research is time constraints, lacking of guidance respectively. Next barriers are language (39%),infrastructure &administrative support(26%),funds(25%).(Figure.2)
- Post workshop assessment of ICMR STSS project submission by the students revealed a significant increase in participation of the target population compared with the previous year [15% in 2018 vs 3% in 2017].

Table 1: Preworkshop and Postworkshop analysis of parameters

Parameter	Pre workshop	Post workshop	
Awareness	47%	86.7%	‘ z ‘ test p value <0.001
Preparedness	13%	90.5%	
Knowledge	20%	82%	
Separate training for RE	22%	76%	

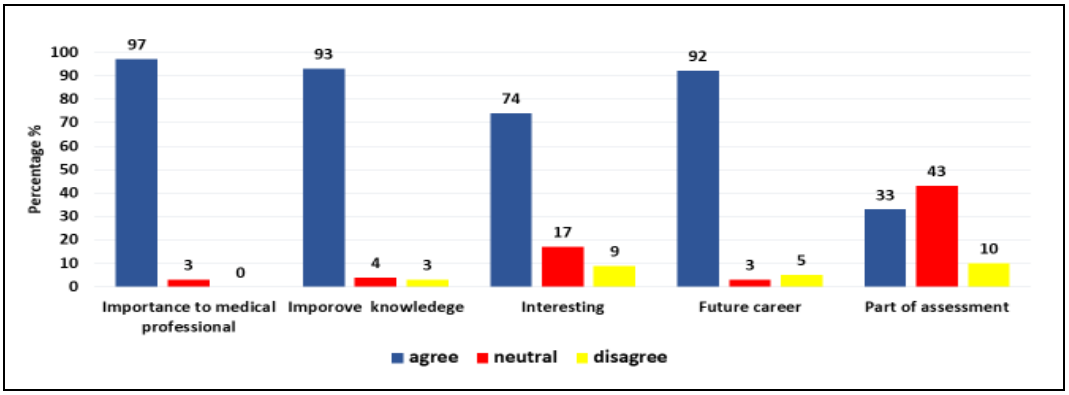

Fig 1: Shows post workshop analysis on ATTITUDE aspects of research Methodology

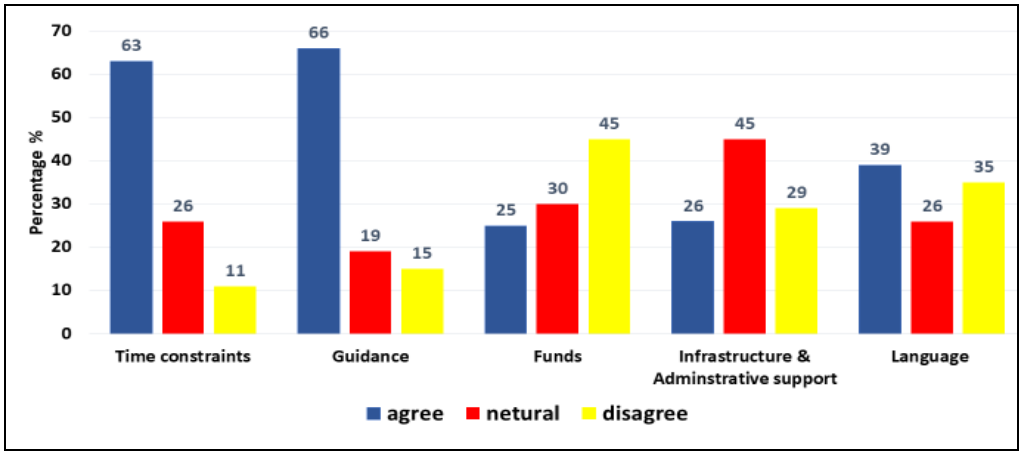

Fig 2: Shows post workshop analysis on BARRIER aspects of research Methodology

Discussion

Research is often given the back seat in Undergraduate medical education which seriously undermines the student's scientific capability. Though the western communities have long incorporated research into their training schedule, developing nations are lagging far behind in this aspect [10, 11]. However, the scenario is changing with students being given a proactive role in research process in the past few decades [12]. Formidable barriers to research include administrative inertia, financial support and individual interest. Furthermore, increasing congestion of medical curricula have resulted in inadequate time allocation to hands on training on research methods. Students have an enormous capacity to get involved in research activities which is seldom harnessed. The goal of converting a medical student into a thorough professional and lifelong learner would never materialize without inculcating research capability in him [13].

Pioneers in the field of educational research opine that an exercise science curriculum provides students the opportunity to become responsible professionals of competence and integrity in the area of health and human performance [13]. The ability to conduct a research is an important skill for the individual's academic and professional excellence. Exclusive training in research methodology and protocol formulation strengthens the independent critical thinking skills as well as communication skills [14, 15]. Undergraduate students who were trained in the departments where the research projects occurred revealed higher order thinking skills and sustained motivation to learn. Frishman explains that research training will enhance the scrutiny skills and critical appraisal of medical literature in the student [16].

We conducted the survey research of II MBBS students before and after the training course on research methodology using a comprehensive student questionnaire. An important observation in our study was the lack of awareness among students regarding the opportunities for research at our institute [Figure 1.]. An alarming 58% of the participants were oblivious of options available. This however became favorably altered after the sensitization programme. One study in India reported that 91% of interns had no research experience in their medical school [11]. This was a not an unexpected observation as earlier studies have reflected similar results [17]. Other significant pre workshop observations included a low preparedness [13%] and poor fund of knowledge [20%] in research process [Figure 1.]

In our study we observed that 20 % of our students had no primary knowledge of research methodology, but once briefed 74 % were eager to get involved in research projects. The results of a survey conducted at Queen's University, University of Ottava and University of Western Ontario revealed that 83% of students agreed that research participation was valuable in their medical training course [17]. Studies report that participation in undergraduate medical research motivates the students to pursue further research [9, 18, 19].

After this training course in research methodology the changes observed among student population were analyzed under 3 domains, namely attitude, knowledge and barrier perception [Figure 1&2]. The attitude of the participants underwent a phenomenal change post workshop with a fourfold rise in research-oriented career planning [92%]. Studies in other countries also reflected similar trend. After an undergraduate research experience, 68% of students stated they had some increased interest in pursuing a STEM career (i.e. Science, Technology, Engineering, or Mathematics). Additionally, 29% developed a new expectation of obtaining a PhD due to the experience of undergraduate research. However there arose a mixed response to the inclusion of student research performance into university assessment methods, with 43% disagreeing to the suggestion.

From the students' standpoint many impediments were highlighted in implementing research oriented undergraduate curriculum. The foremost among them was non availability of efficient guides to navigate them across the research course [66%]. Good mentorship is a vital component of effective student research, without which any research plan is bound to fail. Akin to previous published data, time [63%] and language [39%] constraints were identified as formidable barriers against student research activity. Timing of the research training is crucial to bear enduring results. It has oft been stressed upon that long-term approach to promote research in health care professional courses is to target medical students early in their careers [15, 20]. Interestingly, there was a strong disagreement to lack of funds being a hurdle for research.

The aftermath of this study was an eye opener to all the faculty of our institute who perceived new found motivation to incorporate research into the undergraduate curriculum. From the side of students, there was an upsurge of research projects [ICMR STSS] which comprised of high-quality research proposals.

Conclusion

The vast majority of II MBBS students are unaware of the importance of research in the field of medicine, which could be enhanced by a sensitization programme. There is hidden wealth of intelligence in our medical students which needs to be tapped for greater gains. Given the right environment young medicos are enthusiastic and willing to engage themselves in research-based activities. The students however should be enabled to do research by a structured training programme ideally during their II MBBS period.

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