Introduction of Interactive Teaching for Undergraduate Students in Community Medicine

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Abstract

Background: There is lack of interest in the subject of community medicine among undergraduate MBBS students leading to poor understanding of community problems and drastic fall in preventive, promotive component of health care. Aim: To evaluate effectiveness of interactive teaching (ITL) over traditional teaching learning (TTL) methods in creating interest in the subject. Objectives: 1. To identify the need of interactive teaching among students. 2. To know the perception of students towards it. 3. To know the views and opinion of faculties towards it. Materials and Methods: An interventional study at NRIIMS, Vishakhapatnam. After need assessment survey, undergraduate MBBS students were randomly allocated to study (A) and control groups (B). 2 topics were taught using ITL and TTL in group A and B. After a washout period of 15 days, 2 other topics were taught using ITL in group B and TTL in group A, which was followed by assessment. Feedback from students and faculties were taken at the end of session. Results: 82% of students felt significant need of interaction in classroom. There was an increase in performance of students in the intervention group in terms of better scores (>75% score) which was found to be statistical significant in all the four sessions (P value are 0.0230, 0.0058, 0.0075, 0.0034 for TPS, BS, CBS, PTP respectively). Students were satisfied, so as the faculties with the implementation of ITL module. Conclusions: Student performance was increased. Overall satisfaction was good among students and faculties.

Keywords: Buzz sessions, case-based study, interactive teaching and learning, pass the problem, PowerPoint presentation, randomized control trial, think-pair-share, traditional teaching and learning

Introduction

Traditional teaching practice in the current era is found to little outdated and noninteresting. Using the current techniques, the lesson taught to students is not skill oriented, and therefore, although we are producing good number of health workforce, we are unable to meet the needs of the community.¹

One-way communication in lectures does not influence the learners' behavior met in the classroom which in turn fails to create competent and passionate doctors.²

There is a growing concern among medical educators that conventional modes of teaching medical students neither encourage the right qualities in students nor impart a life-long respect for learning.³

Interactive learning actively engages the students, reinvigorates the classroom for both students and faculty, encourages students to take responsibility for their own learning, and promotes characteristics of effective learning.⁴⁻⁶

Interactive teaching methods could be done using large group, small groups, pairs, and individuals.⁷ Methods used in the study are think-pair-share, buzz sessions, case-based learning (CBL), and pass the problem. This study highlights the need and demand of interactive teaching methods in medical education.

Aim of the study

The aim of the study was to evaluate the effectiveness of interactive teaching and learning (ITL) methods over
traditional TL methods in creating interest in the subject community medicine and effective learning.

Objectives of the study
• To identify the need of interactive teaching among the undergraduate students in community medicine
• To know the perception of students toward it
• To know the views and opinion of faculties toward the implementation of ITL methods.

Methodology
• Study design: An educational interventional study (randomized control trial [RCT] with crossover design)
• Study setting: NRIIMS, Vishakapatnam
• Study duration: March 2018 to August 2018
• Study participants: Seventh-semester defaulter students (28)
• Sampling method: Convenient sampling
• Study tools: Predesigned and prevalidated semi-structured needs assessment and feedback questionnaire.

The needs assessment survey had questions regarding sociodemographic information, perception toward the subject, difficulty in learning the concepts of community medicine compared to other parallel subjects (ophthalmology and ENT) in a scale of 1–5, where 1 is very easy and 5 is very difficult, reason of missing community medicine classes, and need of the intervention.

Similarly, feedback questionnaire also had questions on sociodemographic information, detail information about the session content, duration, organization, its future implication, satisfaction of students, and perception of students toward the effect of interactive teaching sessions in Likert scale.

An in-depth interview was done with involved faculties to know their perception toward the intervention and implementation process.

After the needs assessment survey, an ITL module was developed including choosing topics, allocating teachers, interactive T/L methods, time, and assessment questionnaire for each topic.

Consent was obtained and both students and teachers were sensitized. Students were randomly allocated to study and control groups. Two different topics (analytical study and experimental study) were taught using two ITL methods (think-pair-share and buzz sessions) in the intervention group (A) and TTL method (PowerPoint) in another group (B). After a washout period of 15 days, the crossover of groups was done to reduce students’ bias, where two different topics (antenatal care and childcare with integrated management of neonatal & childhood illnesses (IMNCI)) were taught using two ITL methods (CBL and pass the problem) in the intervention group (B) and TTL method (PPT) in other group (A). Each session was followed by the assessment multiple choice questions and short answer question (MCQs and SAQ) of both the groups to compare the results [Figure 1]. To decrease the subjective bias, the teachers were also crossed over after each session. Feedback of students and in-depth interview of the faculty was done at the end of all the sessions.

Intervention (Interactive T/L methods)
Think-pair-share
Students share and compare possible answers to a question with a partner before addressing the larger class.[7] Study group A students divided into seven pairs and gave individual subtopics to discuss (cohort and case–control study: concept of study and types, steps, relative risk, attributable risk, odds ratio with some problems, advantages, and disadvantages). After that, each pair shared their answers in the large group which was facilitated and compiled by the teacher 1.

Buzz session
First used by Dr. Donald Phillips, it can be applied whenever a large assembly of people is divided into small groups (usually of no less than three and no more than eight) which, for a limited time and simultaneously, discuss separate problems or various phases of a given problem. If possible, recorders from each of the groups report their findings to the reassembled large group.[8] In our study, the study group students were divided into four subgroups: two groups having three students each and the other two groups having four students each. Then, subtopics were given to individual group for discussion (steps in randomized controlled trial, phases of clinical drug trail, non-RCT, association, and causation). Teacher 2 was facilitating the discussion by visiting each table. At the end, all the group leaders shared their summary of discussion moderated by teacher.

Case based learning
Using clinical cases to aid teaching has been termed as CBL. It links theory to practice, through the application of knowledge to the cases, using inquiry-based learning methods (Thistlewaite et al.).[9] An antenatal case scenario was given for discussion to study group B (four subgroups each
having three or four students) (28 weeks of gestation having anemia and bilateral pitting edema). Students discussed the case given with different leads (1 – raised blood pressure, blurring of vision, and headache; 2 – high blood sugar and excessive weight gain; 3 – history previous abortions, present s/s of vaginal spotting, and abdominal cramping; and 4 – persistent nausea and vomiting throughout the antenatal period which has increased recently with signs & symptoms (s/s) of dehydration and fainting) in groups and presented the case. Teacher 1 facilitated the presentation afterward discussing the issues related to it and the management of the given case in different scenarios.

**Pass the problem**

Divide students into groups. Give the first group a case or a problem and ask them to identify (and write down) the first step in solving the problem or analyzing the case (3 min). Pass the problem on to the next group and have them identify the next step. Continue until all groups have contributed.[7] Group B students were divided into four subgroups each having three or four students. Four different case scenarios were given related to childcare as per IMNCI. Each subgroup had to solve part of the problem given (assessment, classification, management, advise/counseling, and follow-up as per IMNCI) by passing the problem. At the end, the teacher interacted with all discussing the detail of cases.

**Results**

A needs assessment survey was conducted out of 33 defaulter students, of which 28 students participated. Forty percent were male and 60% were female. Only 38% of the students were following standard books. None of them like to read community medicine books and the main reason being (65%) not able to understand the content followed by other reasons such as subject being boring (20%) and full of imagination/stories (11%).

Out of 28, majority (24) of the students stated that they usually miss the community medicine classes once or twice a month mainly attributed to factors such as less engagement in class (100%), followed by noninteresting lectures (91.6%), preferring self-study (91.6%), and difficulty in understanding the subject (83%). Apart from that some other personal, classroom factors, peer pressure, faster pace, too much stuff, and monotonous lectures were few important factors affecting the attendance as mentioned by the students.

Eighty percent of the students were facing difficulty in understanding the content in community medicine and having the view of TTL methods being not sufficient for learning community medicine concepts. Similarly, 84% of the students felt the need of interesting TLMs for engagement in class and 92% opined for the requirement of more interaction in community medicine classes.

Rating the difficulty level of learning the concepts of community medicine compared to other subjects (ophthalmology and ENT) of 3rd-year professional MBBS in a scale of 1–5 showed that 90% felt that community medicine is very difficult compared to others [Table 1].

The feedback responses were collected from all students who participated and attended all the ITL sessions (28) and analyzed with the use of appropriate statistics. The data showed that 60% of the students were female whereas 40% were male and 58% were day scholars whereas 42% were hostelites. Around 86% of the students were not aware of the ITL methods before.

The present study revealed that 92.86%, 50%, and 75% of the students were satisfied with the appropriateness of content, adequacy of duration, and planning and implementation of ITL module among the students, respectively. Around 92% of the students were overall satisfied with the introduction of ITL sessions in community medicine classes [Table 2].

Similarly, feedback data of students also revealed that ITL methods were successful in increasing the interaction (78.57%) and communication (71.43%) among students along with interest (57.14%) and understanding (67.85%) of the contents in community medicine. Around 67.86% of the students found it helpful for examinations. Students had a 50:50 view toward ITL methods being a part of curriculum [Figure 2]. It was observed that 94% of the students wanted to attend other ITL sessions in the future apart from the four used in the module. Among four various ITL methods used in the project, pass the problem (67.86%) was found to be the most enjoyed and liked one among students, followed by buzz session (BS), think pair & share (TPS), and CBL based on the ratings of ITL methods in a scale of 1–10, where 1 is least and 10 is best.

Attendance was increased 7%–10% after each ITL session. In student performance analysis after introducing ITL sessions (TPS, BS, CBL, and PTP [pass the problem]), it was revealed that 39.29%, 32.14%, 35.72%, and 50% of the students scored >75% in the intervention group compared to only 14.28%, 3.58%, 7.14%, and 21.42% in the other group where traditional teaching was carried out [Figure 3].

The association between ITL session and scoring >75% in assessment was found to be statistically significant in all the four sessions ($P = 0.0230, 0.0058, 0.0075,$ and 0.0034 for TPS, BS, CBL, and PTP, respectively) analyzed using Pearson’s Chi-square test assuming normal distribution.

The in-depth interview of faculties revealed that there was an increased teacher–student interaction, student–student

| Table 1: Needs assessment survey: Difficulty level of 3rd-year professional MBBS part 1 subjects in a scale of 1–5 (where 1 is very easy and 5 is very difficult) |
| **Subject** | **Difficulty rating scale** |
| Ophthalmology (%) | 2 | 60 | 30 | 8 | 0 |
| ENT (%) | 0 | 70 | 24 | 6 | 0 |
| Community medicine (%) | 0 | 0 | 3 | 7 | 90 |
interaction, engagement, communication, and positive attitude toward community medicine. However, limited time, losing control, unfinished content, lot of planning, and paperwork were the big concerns raised by the faculties.

**Discussion**

The attention span of a medical student was found to be optimal till 20 min following which it rapidly faded off. To improve the classic lecture, interactivity between participants is a must. This promotes active learning, heightens attention and motivation, gives feedback to the teacher and student, and increases satisfaction for both. To improve the classical didactic lecture, numerous methodologies have been devised. Multimedia has been incorporated in lectures to convey information. Although this has enabled more content to be placed intuitively, an inappropriate usage of the presentation tool can make the students paradoxically more inattentive. Active involvement students who are actively involved in the learning activity will learn more than students who are passive recipients of knowledge (Butler, 1992, and Feden, 1994).

Increased attention and motivation enhance memory. Increased arousal and motivation are the essential ingredients for learning (Frederick, 1986, and Foley and Smilansky, 1980).

The present study showed that 86% of the students and 28% of the faculties were not aware of the ITL methods. It could be due to the lack of practice of ITL methods in old curriculum which has been revised in new competency based medical education (CBME) curriculum which encompasses the use of various ITL methods.

Increased attendance of 7%–10% was observed after each ITL session although it was not mandatory. However, attendance is always an issue in normal lectures of community medicine. Similar facts were observed in another study where traditional lecturing has been criticized for not being able to hold students’ (or learners’) attention throughout teaching sessions and has been associated with relatively low grades and reduced attendance rates.

It was observed that majority of the students satisfied with ITL module in terms of increased interaction and improved communication, interest in the subject, and understanding of the content. The same findings were observed in a study where traditional lecturing promoted a higher level of thinking which includes analysis and synthesis of material, application to other situations, and evaluation of the material presented.

Around 67.86% of the students found it useful for future examinations although 25% were not sure about it and 7.14% disagree with the statement. It could be due to their apprehension toward examination, attitude toward the subject, and lack of knowledge on different ITL methods. Several challenges may arise during attempts to shift the teaching/learning method from traditional lecturing to a more interactive learning style. Challenges can be related to the organization, resources, staff, and/or the students.

There was a 50:50 view on ITL being a part of routine lectures. This is attributed to the habit of traditional one-way communication, lack of enough time and resources along with...
existing resistance to change, and attitude of finishing up rather than conceptualizing. The fear of losing control and the fear of not covering all the materials along with time constraint prevent a teacher from giving ITL sessions.[6] It is true that a “number of facts” need to be reduced in order for a lecture to become interactive; we also know that if we present too much information, students will retain less (McKeachie, 1994; Newble and Cannon, 1994; and Russell et al., 1984).

Ninety-four percent of the students wanted to attend other similar ITL sessions in the future. Among various ITL methods adopted for the project, pass the problem was found to be the most enjoyed and liked one among students and faculties. Similar findings were highlighted in a study which stated that the main strategy of modern education should focus on the students’ independent activity, the organization of self-learning environments, and experimental and practical training, and interactive teaching which contribute to the complex competences of future specialists.[16]

In student performance analysis, it was found that the association between ITL session and scoring >75% in postassessment was statistically significant in all the four sessions. Similar findings encountered in a study where it was observed that true interactivity, both in the interface and in the presentation methodology, will further enhance learning and knowledge retention among students.[17]

An in-depth interview with the faculties showed a positive response toward ITL although time, resources, lot of planning, fear of losing control, and not finishing the content in time were the big concerns for all. Likewise, certain specific obstacles are associated with the use of interactive learning including limited class time, a possible increase in preparation time, the potential difficulty of using active learning in large classes, and a lack of needed materials, equipment, or resources.[18]

CONCLUSION

Less favorable attitude and interest in the subject of community medicine were identified by the needs assessment survey. After introducing the interactive teaching module, student performance was increased in terms of knowledge, interaction, attendance, and engagement in class. Overall satisfaction was good among students and faculties. Based on the findings of the study, the author would like to recommend the introduction of ITL methods in regular classes of undergraduate medical education curriculum.

Limitations

The limitation of the study was the small sample size and the inclusion of only four ITL methods.

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Conflicts of interest

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