

INTERACTIVE INTRA-GROUP TUTORIALS: A MODIFICATION TO SUIT THE CHALLENGES OF PHYSIOLOGY TUTORIAL IN RURAL MEDICAL SCHOOLS

Background: Tutorial embodies a major teaching learning strategy in basic sciences of medical education. Essentially tutorial should be a small class of few students in which the tutor gives individual attention each student. However; increase in student strength, and concurrent decrease in the faculty requirements by regulatory bodies in recent years; have posed immense hiccups in organizing tutorial in small groups.

Aims & Objective: Objective of present study was to evaluate the feasibility of modifying traditional tutorial as Interactive Intergroup tutorial (IIT) and its efficacy to improve learning outcome.

Materials and Methods: Study was conducted in Department of Physiology, Jawaharlal Nehru Medical College, Wardha, with sample population as students in first year of medical curriculum (n=150). They were sequentially subjected to traditional tutorial & Interactive Intragroup tutorial for 4 weeks. Difference in impact by the two methods was studied by pre and post - test design.

Results: There was a significant difference in pre and post-test $P = 0.011$ and $P = 0.023$ ($P < 0.05$ was considered statistically significant) by traditional tutorial and Interactive Intragroup tutorial respectively. The difference in post test scores by both methods was found to be highly significant $P = 0.00$.

Conclusion: The modified method can serve to be logistically straightforward to implement in a large class, particularly in subjects of basic sciences with added benefits of establishing group dynamics, interactivity, improving presentation and reasoning skills which are otherwise not a part of traditional tutorials.

Key Words: Physiology; Interactive Intragroup Tutorial; Traditional Tutorial

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Received Date: 24.09.2013

Accepted Date: 11.10.2013

DOI: 10.5455/njppp.2014.4.111020132

INTRODUCTION

Tutorial is contemplated as a period of instruction given by a University or college tutor to an individual or a very small group. Essentially it is a small class of one, or only a few, students, in which the tutor (a lecturer or other academic staff member) gives individual attention to the students. The tutorial focuses on a certain subject areas and generally proceeds with careful reading of selected primary texts and working through associated exercises. It was in September 1964 that McGill University introduced tutorial system for 1st year medical undergraduates.^[9] A year later it was extended to second and final year students based on strong favor of the same by undergraduates. The main purpose of the program was to ensure repeated exposure of the students to individual competence of outstanding teachers.^[9]

Since then; tutorial is adapted as a mandatory part of medical curriculum in schools. Similarly in developing countries like India; individual subjects in medical faculty incorporate tutorials in their time tables. Despite the known beneficial effects of small group learning, for practical reasons like increase in student numbers, decrease in the faculty requirements by the regulatory

bodies, and additional challenge of faculty retention in the rural medical schools, circumstances in basic sciences have necessitated deviations from the original concept with regard to set-up and group size. For example, although groups of 8-10 students with one tutor are generally considered optimal, there have been a substantial increase in the number of students per group with time.^[7] Most traditional tutorials (TT), are led by faculty members, and students act as passive recipients. Students get a limited opportunity to express their opinions and enhance their communication skills during tutorials.^[8] In this regard some studies have reported incongruence between educational theory and practice in traditional tutorial method.^[1,6] It may be prudent, therefore, to look for adequate but less resource intensive alternatives, keeping in consonance with the potential benefits of tutorials.

At our University we have an annual intake of 150 students. Tutorials in physiology are routinely conducted as a part of the curriculum. However, due to large student number and paucity of staff, the students are divided into 4 groups with one tutor assigned to each group. The conduction of tutorials with small group becomes impossible with limited number of faculty resources.

Adapting a modified method can act as a preferred alternative provided the benefits are weighed against the already established practices. Interactive Intergroup Tutorials (IIT) may offer a good alternative, because they enable active participation and interaction but are less of a drain on resources, as they can accommodate large group of students in one class, who can be further subdivided into small groups. This modified method allows the benefits of small group learning keeping in view the limited number of tutors available by assigning several small groups to one tutor. Small group learning has been reported to have a direct positive effect on students' motivation to learn and motivation has been shown to play a central role in promoting group productivity, elaboration of knowledge, and interaction in different settings.^[5,6] Besides; this modified tutorial method can also make use of several techniques to promote interactivity which has been evaluated more positively than formal lecturing by medical students and medical professionals alike.^[2] Establishing group dynamics, active interaction, improving presentation skills, competitiveness and reasoning skills, are some of the supplementary gains of this modification which unfortunately are not considered as a part of tutorial under current practices. Indisputably tutorial is primarily meant to improve the level of education, but it must not ignore the other aspects of the student's life which profoundly influence the educational experience.^[9] The present study is an attempt to put the modified tutorial method i.e. IIT under trial for assessing its feasibility and efficacy to improve performance.

MATERIALS AND METHODS

The study was conducted in Department of Physiology, Jawaharlal Nehru Medical College, Sawangi (M), Wardha, Maharashtra, India after ethical permission from Institutional ethical committee. It is an Experimental, open labeled study where 150 students as participants (batch 2012) were sequentially subjected to traditional tutorial and modified tutorial i.e. Interactive intragroup tutorial method. The tutorials are conducted in the second semester of first phase of medical curriculum. There is a permanent slot for physiology tutorial in the time table on Tuesdays and Fridays which comes to two days / week i.e. 8 tutorials per month between 2-3 pm i.e. one hour. At the beginning of second semester, all students were oriented regarding the nature of study and informed consent was obtained for the same. Attendance in all the tutorials classes were considered mandatory. In case, the student was absent in one or more tutorial; his/her performance

was not analysed; though he/she was allowed to attend further tutorials.

Traditional Tutorials (TT): In December '12 multi-voting was conducted for 150 students in 4 groups with a list of 15 important topics for excretory system to be taken as tutorials. After averaging the vote of all the four groups, eight most preferred topics in excretory system were taken in a serial and logical sequence to be conducted as tutorials in the month of January. As per routine practice, the batch of 150 were divided into group of 4 (Group A – 37, Group B – 37, Group C- 37 and Group D – 39). A pre – test followed which was based on the eight topics to be discussed comprising of validated 30 MCQs and 5 viva questions. The topic to be discussed for tutorial was displayed on the notice board two days prior and students were asked to be prepared with the same. On the day of tutorial, the topic was taken for discussion by the tutor assigned to the group. The discussion was structured, based on pre-decided subtopics by the Head of Department in consensus with the tutors. This ensured a uniform discussion in all the four groups. In this type of tutorials; much of the participation was observed from the more motivated student or the one who was well prepared. There were passive recipients and dominant responders. Tutorials in traditional way was taken up for four weeks which amounted to eight sessions. After the last tutorial; post-test was taken.

Interactive Intragroup Tutorials (IIT): The first week of February was devoted to multi-voting for the topics on cardiovascular System (CVS); as was done for traditional tutorials. Eight topics were subsequently identified for IIT. A small sensitization session was taken by the researcher for the tutors regarding the modified method in presence of Head of Department. The briefing session was observed by a faculty from Department of Health Professions Education of the University. As per practice, a pre-test was taken based on the eight topics through validated 30 MCQs and 5 questions for viva. The topic along with its sub-topics to be discussed was displayed on the notice boards two days prior. During tutorials, each group (n=37) was further subdivided into 4 small subgroups consisting of 9 students each, with last subgroup of 10 students. The last group (i.e. group D, n = 39) was divided into small subgroups of 10 students each with last subgroup with 9 students. One subtopic was allotted to each group and they were asked to prepare a comprehensive write up about that topic, following all the principles of group dynamics (The principles of group dynamics were taught during their posting in

communication skills laboratory). They were given 20 minutes for the same. The tutor monitored the intragroup discussions during that period. Later, the groups were asked to present their material in front of large group. However; the presentation was to be done by any member other than the group leader. After presentation the other groups were asked to come up with missing points or any further addition to the topic. Those points were incorporated in original presentation provided the tutor deemed it important. This way all the four groups presented their work. The tutor then summed up the whole discussion with pertinent points. All the eight tutorial classes were conducted similarly after which post – test was taken.

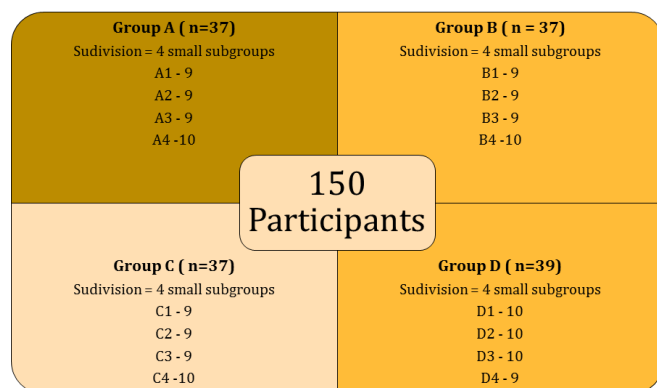


Figure-1: Division and sub-division of groups for interactive intragroup tutorials

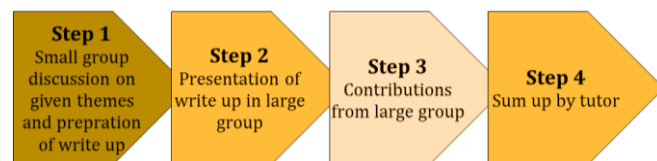


Figure-2: Sequence of steps followed during conduction of Interactive Intragroup Tutorials

Impact Analysis: Pre and post-test design was adopted for the study to evaluate the impact of the two methods. The pre and post-test scores via both methods were compared for significance by paired t-test. The post test of both the groups were analyzed by unpaired t-test for significance. The test was of total 50 marks based on 30 validated MCQ (30 marks) and 5 structured viva voce questions (20 marks). The viva voce was structured with a set of 20 questions along with model answers and pre-decided rating scale. It was taken care to keep the oral examination skewed towards comprehension and analysis of the course content rather than simple recall; which was already covered under MCQ section.

RESULTS

The first observation; though not a part of data analyses,

was better participation of students with TT method where the attendance ranged between 97 - 98%. Five students who were absent for one or more TT were not considered for analyses. However; in IIT attendance ranged between 97% - 95.3%. Seven students were not included in analyses for being absent in one or more IIT classes.

Mean pre-test score of TT was 14.59 and for post – test it was 35.06. Mean pre-test score of IIT was 14.2 and for post-test it was 37.43. The pre and post - test scores of the traditional tutorial, when compared by paired t - test, was found to be statistically significant $P = 0.011$ ($P < 0.05$ was considered statistically significant). Similarly, the pre-test and post test scores of IIT was also found to be statistically significant $P = 0.023$ (Table 1). The post test scores of TT ($n = 145$) and IIT ($n = 143$) were compared by unpaired t – test, which was found to be highly significant; $P = 0.00$ ($P < 0.05$ was considered significant) (Table 2).

Table-1: Statistical analysis of paired pre and post test scores by traditional tutorial and interactive intragroup tutorial

Method		Mean	N	SD	SE of Mean	P value
Traditional Tutorials	Pre - test	14.59	145	2.21	0.18	0.011
	Post - test	35.06	145	4.57	0.37	
Interactive Intragroup Tutorials	Pre - test	14.20	143	2.17	0.17	0.023
	Post - test	37.43	143	6.58	0.53	

Table-2: Statistical analysis of post test scores by traditional tutorial and interactive intragroup tutorial method

Method		Mean	N	SD	SE of Mean	P value
Traditional Tutorials	Post - test	145	35.06	4.57	0.37	0.00
Interactive Intragroup Tutorials	Post - test	143	37.43	6.58	0.537	

DISCUSSION

Physiology is one of the foundation sciences for the medical curriculum. It needs to be taught and learned effectively so as to be placed in the context of disease when the medical students graduate and practice in the community. In most of the medical schools of India, it is mainly taught by means of didactic lectures, practical classes and tutorials. Such a system is teacher centered with minimal active participation from the students.^[10] Though tutorials serve a major method of teaching of Physiology at our University, the essence is however lost due to major challenges of decreasing faculty strength (as per regulatory requirements) and increasing number of students. This study was an initial attempt to suggest and evaluate the efficacy of an alternative method of conducting tutorial without disturbing the traditional approach and yet ensuring maximum participation. Other

aspects of learning like working in a team, presentation skills, and critical-thinking were also incorporated which are often neglected in traditional method. A review of cognitive and motivational effects of small group tutorials has proved that small study groups foster interactive learning and positive cognitive effects, such as activation of prior knowledge, recall of information, individual and collaborative knowledge construction, and cognitive conflicts leading to conceptual change.^[3,4,10,11] We tried to assimilate these benefits of small group learning through the suggested modification in routine tutorials. The analysis revealed that learning improves by both methods; however the performance improvement was better with interactive intragroup tutorial method. The reason was apparent as more number of students actively participated in the modified method where they were subdivided into small groups. The students who feared or were conscious to speak in large group, opened up well within small group. This ensured active involvement of every student and hence the improvement in scores was highly significant by this method. Probably this was also the reason why participation was slightly less as compared with traditional method as the students had to be actively involved. Those who were not prepared with the topic avoided attending the tutorial. Students with more knowledge helped more in the discussion and led the whole group to acquire wider subject knowledge.

Scores in MCQ was improved equally by both methods, which ensures better recall after tutorials. However; there was a remarkable improvement in oral examination after IIT which suggests gain in comprehension and analysis of the topic. As learning needs to be an active constructive mental activity; to make someone understand a particular area of knowledge, it is best to involve them.^[10] This modified version of tutorial served the said purpose in allowing students to handle the topic analytically with individual participation, thus improving higher cognitive skills. Active participation, collaborative team work, opportunity to improve their presentation skills, was an appreciated feature of this method as per the informal feedback by the students and tutors. The students were more confident, in better position to defend their responses and reasoning skills.

The suggested modification provides an efficient alternative where the faculty; though sparse; can still give personal attention to every student and is available to answer questions and guide the discussion. However; the tutors should be trained to manage no. of small groups within the large group & ensure maximum participation.

CONCLUSION

The suggested method serves to be logistically straightforward to implement in a large class, particularly in subjects of basic sciences where tutorial serve a major teaching learning tool. Since the results are favorable by interactive intragroup tutorials; it might be worthwhile to conduct further studies to investigate whether and how it can offer an acceptable alternative to traditional method in Indian settings. So, the practice points are, (1) Tutorial should be taken as a major teaching learning tool of basic sciences. (2) Efforts should be directed to make tutorials more learner centered. (3) It should promote interactivity to encourage active learning. (4) The suggested modification in tutorial helps in inculcation of group dynamics and presentation skills. (5) The faculty should be trained in conducting tutorials to maximize benefits.

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Cite this article as: Srivastava TK, Waghmare LS. Interactive intra-group tutorials: A modification to suit the challenges of Physiology tutorial in Rural Medical Schools. *Natl J Physiol Pharm Pharmacol* 2014; 4:128-131.

Source of Support: Nil

Conflict of interest: None declared