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ORIGINAL ARTICLE

Didactic Lectures And Interactive Sessions In Small Groups: A Comparative Study Among Undergraduate Students Of Pharmacology In India

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ABSTRACT

Context: Small group teaching is considered to be more effective than didactic lectures. But is it sufficient just to reduce the size of the class? This study examines the effectiveness of two styles of teaching among a small group of students. Aim: To study and compare the effectiveness of two teaching methods in Pharmacology: Didactic lectures and interactive sessions in a small group of undergraduate students of physiotherapy. Settings: Five topics of Pharmacology on antimicrobial agents were taught by the didactic lecture method in five consecutive classes of one hour each and another five classes were conducted by interactive sessions, both by the same teacher to a group of twelve students of Physiotherapy of Manipal University. At the end of each class, the students were tested by a multiple choice type of questionnaire. Students also answered the same questionnaire in groups of four. The mean marks of each student were compared by using the Student's t-test for statistical significance. Results: Difference in the mean marks scored by students in the didactic lecture group and in interactive sessions was found to be statistically significant. The difference in the mean marks obtained by individual students and the mean marks obtained in groups with the didactic lecture method were statistically significant [P<0.001], whereas the difference in the mean marks obtained by individual students and the mean marks obtained in groups when taught by interactive sessions were not significant [P>0.30]. Conclusions: The present study demonstrates that interactive sessions are responsible for the effectiveness of small group teaching. The results have also shown the importance of studying in groups to solve problems and to find answers in preparing for examinations.

Key Messages:

1. Reducing only the size of the class is not sufficient for improving the students' performance; the teaching sessions need to be more interactive.
2. Learning the subject in groups improves the performance.

Key Words: Didactic lecture, interactive session, small group,

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Introduction

Teaching methods vary. They include lectures, group discussions, problem solving exercises, and small group teachings, fast forward rounds to name a few [1] ,[2]. Transitions between various teaching and learning styles are subtle and gradual. If didactic lectures are at one end, where student participation is minimal, at the other extreme is the private study by the student, where direct teacher participation is almost nil. Small group teaching can be placed somewhere

in between these extremes, where there is a good interaction between the student and the teacher. In this institution [Manipal University] as in many others in India, didactic lecture [DL], irrespective of the size of the class, is the usual mode of teaching of topics in theory. The concept of interactive sessions [IS] and small group teaching is not new. Socrates was a great exponent of this method of teaching [3]. According to some research projects such as Tennessee's STAR[4], reducing the size of the class will produce many benefits for teachers and students. Because of the small numbers, students receive more individual attention, teachers will be able to manage the students better, discipline problems are likely to be less and there is more interaction between students and teachers. When the teacher spends less time in managing the students, more time can be utilized in teaching [5]. But there are also disadvantages of small classes, such as the need to employ larger number of teachers and the investment on infrastructure, like the construction of new class rooms. Many of the available studies insist on the effectiveness of small group teaching [SGT] as against didactic lectures. An effort is made in this study to look into the effectiveness of didactic lectures and interactive sessions, both in a small group of students of physiotherapy, to find out whether it is interactions that are responsible for the better performance of students, or the small size of the group. The objectives of this study are, to compare the effectiveness of two teaching methods in pharmacology; didactic lectures and interactive sessions in a small group of undergraduate physiotherapy students and also, to demonstrate the importance of group discussion in the study of pharmacology

Subjects and Methods

Study setting: The study was carried out in the Department of Pharmacology, Kasturba Medical College, Mangalore, among the under graduate students of physiotherapy [BPT]. There were twelve students in this particular batch. All the students volunteered to participate in the study. Individual consent was obtained. Hence, all the twelve students were available for each of the ten classes. The small sample size was accepted, as the study objective itself was to compare the effectiveness of the two styles of teaching in small groups. We wanted to study whether it is the style of teaching that matters or the size of the group. However, the group of twelve was tested five times each for each style of teaching. The study was carried out after obtaining the permission of the institutional ethical committee.

Procedure: Pharmacology is taught during the second year of the three year course, for under graduate students in physiotherapy [BPT], in Manipal University. The topic of chemotherapy was taught in ten classes of one hour each. These classes were divided into two groups of five classes each, for the purpose of this study. Five topics were taught by didactic lecture method in five consecutive classes and the remaining five classes were conducted by interactive sessions, both by the same teacher. The lesson plan was given to students well in advance of each class. Student teacher interaction was least during the course of the didactic lectures, except the session that the students had at the end of each class to clear any doubts. The interactive sessions were mainly based on plenty of interactions between the students and the teacher. Each student was encouraged to present a small portion of the lesson plan. Students were also encouraged to ask questions to each other and also to the teacher. At the end of the class, the teacher summarized the topic. The students were tested by a multiple choice type of questionnaire which was prepared by teachers who were not involved in the study, at the end of each class. There were forty questions in each question paper, with four choices for each question. The correct answer was awarded 1 mark and for a wrong answer, $1/6^{th}$ mark was deducted. The final marks were expressed out of ten, as usually class grades are expressed out of ten. Students answered these questionnaires individually, as well as in three groups of four students each. Group answering sessions were introduced to convey the importance of group discussion among students. The mean marks of each student in the didactic lecture and interactive sessions, individually as well as in group answering sessions, were tabulated and compared for statistical significance.

Statistical Analysis

The Student't' test was employed to compare the mean marks of different groups using statistical package, SPSS version 10.0.

Results

There were five sessions of didactic lectures and five sessions of interactive sessions. The mean marks obtained when the students answered in groups in each of the sessions, were also calculated.

The mean marks obtained by the students after five didactic lecture sessions [DL], when they answered the multiple choice questionnaire individually, was 7.38±0.14 whereas the mean marks scored by the students after interactive sessions [IS], when they answered the multiple choice questionnaire individually, was 8.62±0.21.This difference was found to be statistically significant [p<0.001].

The mean marks scored by the students when they answered in groups of four were 9.30±0.10 and 9.33±0.02 after didactic lecture sessions and interactive sessions, respectively. The difference in the scores in the didactic lecture sessions, between mean marks when students answered individually [7.38±0.14] and in groups of four [9.30±0.10] was found to be statistically significant [p<0.001]. But the difference in marks in two similar groups in the interactive sessions was found to be statistically insignificant [p>0.30] [Table/Fig 1].

(Table/Fig 1) Comparison of Marks [Mean±SEM] in Various Groups

Groups	DL	DLGP	IS	ISGP
Mean marks [Maximum=10]	7.38±0.14*	9.30±0.10	8.62±0.21	9.33±0.02**

n=12, * p< 0.001 When Mean Marks of DL Compared To DLGP & IS,

**** P>0.30 When Mean Marks of IS Compared To ISGP. Student 'T' Test.**

DL= Didactic Lecture, DLGP= Groups of 4 Students in DL, IS=Interactive Sessions, ISGP= Groups of 4 in IS

Discussion and Conclusion

It is often suggested that lectures may not be the best way to impart knowledge to students[6]. Though a majority of the physiotherapy and other professional schools in India depend upon didactic lectures to impart knowledge to students, medical schools in U.S.A. and Europe adopt small group teaching in medical programmes [7]. Researchers have found that there are many advantages in teaching students in small groups. Some even say that "smaller classes are a key ingredient in student success" [8]. Many studies have demonstrated that small group teaching facilitates the performance of the students [9] Similar results have been reported by Dunnington et.al and Curtis et.al. [10], [11].

However, this study tried to compare the results when small groups are taught by didactic lectures and interactive sessions, with the hypothesis that it is not merely the size of the class but the interactive sessions which are responsible for the improved performance of the students. Accordingly, the results of the present study indicate that even when the size of the class was small, if the teaching style was didactic lectures, the results were poorer as compared to the performance of the same small group of students when the teaching involved was interactive. In other words, these results are in favour of our hypothesis, that if the students are taught by didactic lectures, even in small groups, the performance of the students is poorer as compared to interactive sessions. Probably small interactive sessions are more effective, because students are less distracted, they remain focused and can easily clear their doubts; there is also active participation and more interaction with teachers.

The present study has also demonstrated the importance of group inputs in studying the subject, as against individual efforts. In both the didactic lecture group and interactive sessions, students fared better when they tackled the questionnaire in groups. However, it was statistically significant only in the didactic lecture groups. The reason could be, that there was already an element of group discussion in the interactive sessions. These results underline the importance of studying in groups to solve

problems and to find answers in preparing for examinations. Similar studies, where team based learning [TBL], which included interactive sessions, was introduced in group studies, students felt that these sessions were better at fulfilling learning objectives, they hoped to perform better in the university examination due to this new teaching/learning modality and in general, favoured this modality of interactive sessions irrespective of their grades [12], [13] ,[14].

Reducing the class size is said to be the single most expensive item of education reform[15] .However, the results of the present study indicate that even in smaller classes, interactive sessions play an important role in improving the performance of the students. Mere reduction in the size of the class may not improve the academic performance, if the teaching style continues to be didactic lectures. It will be interesting to find out the performance of the students in larger classes, where teaching is done by interactive sessions rather than in didactic lectures.

The present study repeatedly tested a small group of students in two styles of teaching, as the number of students available were small. Similar studies can be carried out in a class with larger number of students, where the students can be divided into multiple small groups and different teachers can simultaneously carry out didactic lectures or interactive sessions.

To conclude, the present study demonstrates that interactive sessions are responsible for the effectiveness of small group teaching. If the students are taught by didactic lectures, even in small groups, the performance of the students is poorer as compared to that seen in interactive sessions. Test results were poorer when students were taught by didactic lectures as compared to interactive sessions. The present study has also demonstrated the importance of group inputs in studying the subject, as against individual efforts. In both the didactic lecture group and in interactive sessions, students fared better when they tackled the questionnaire in groups. These results underline the importance of studying in groups to solve problems and to find answers in preparing for examinations.

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