

Effectiveness of Small Group Discussion over Traditional Lecture: A Cross Sectional Comparative Study.

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Abstract: *Background:* Educational institutions follow different teaching methodologies to integrate knowledge. Conventional teaching methodology by lectures is followed commonly. There are many small group teaching methodologies which are student-centered. Fishbowl group dynamics is one such technique where both communication skills and observational abilities can be developed in the students.

Objectives: To conduct fishbowl group dynamics and a conventional lecture on the topic "MALARIA", and to assess the effectiveness of fishbowl group dynamics over conventional teaching methodology.

Methods: A Cross-Sectional study was conducted on a group of 55 second-year medical students, divided into groups A and B. Group A with 29 students were taught by a traditional lecture and an MCQ test was conducted for 20 marks, and their opinions gathered. Group B with 26 students participated in fishbowl group dynamics, with an MCQ test, and feedback gathered.

Results: The mean score for MCQ test in traditional teaching was 8.724 ± 3.614 and that in the fishbowl was 10.769 ± 2.875 , which was found to be statistically significant with a p-value of 0.025 ($p < 0.05$). Feedback questionnaire for fishbowl also showed it to be a preferred method of teaching over traditional teaching, as opined by many students.

Interpretation & Conclusions: Fishbowl group dynamics is more effective in gaining knowledge than the traditional teaching method. This technique can also help in increasing the academic performance of the students.

Keywords: Teaching techniques, Fishbowl, Conventional teaching, Feedback.

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I. Introduction

Educational institutions follow different types of teaching methodologies to deliver knowledge to students. Conventional teaching methodology, the most widely used in many educational institutions is a "teacher-dominated interaction" where teaching is deeply teacher-centered, and teachers are the only source of the knowledge, while learners are passive receivers who should memorize things. [1,2]. It encourages one-way communication placing the students in a passive role [3]. It is mostly monotonous with the little or negligible involvement of students [4]. It helps in quick exposure to new material, complementation of text material and exposure to unpublished and not readily available material [5]. Students through traditional teaching methodology focus more on presentation, rather than practicing and understanding concepts, as a teacher has to deliver many truths in a limited amount of time [6]. No other teaching method is widely used and yet more strongly criticized than a lecture [7]. There are many alternative forms of small group teaching techniques which would help students to overcome the cons of this technique.

Fishbowl group dynamics, being a small group teaching technique, helps the students to develop communication skills and observing abilities in an enthusiastic form by creating dynamic, lively, energized and spirited conversations with a variety of viewpoints [8, 9 and 15]. It facilitates an active and independent form of learning, generates interest towards the topic, produces better learning outcome and provides benefit to the speakers [10, 11 and 16]. Providing a platform for complex interactions among the students, it allows the students to learn qualities of leadership, team spirit, cooperative and coordinative skills, mutual interdependence and friendly bond [12, 13 and 14]. Fishbowl group dynamics is used in solving research problems and to resolve conflict issues in many business conferences, workshops, organizations, medical interviews and other institutions [17, 18].

Very few studies have been done, using fishbowl as an educational tool, in medical education. And, it has not been included in the curriculum at our institute. The present study was undertaken to introduce fishbowl small group teaching to students and to compare its effectiveness over traditional lecturing.

II. Material And Methods

A cross-sectional study was conducted on 55 second-year medical students, in July 2016, in the Department of Microbiology at Apollo Institute of Medical Sciences and Research (AIMSR), Hyderabad. Approval from Institutional Ethical Committee was taken before commencing the study, and informed consent was obtained from the participants. 60 second-year medical students were randomly divided into 2 batches 30 students per batch (the study is a small group teaching technology). One batch was considered for traditional lecture (A) and the other batch was taken for fishbowl (B). On the day of sessions, 29 students from group A and 26 students from group B attended the sessions.

Group A with 29 students was given a traditional lecture by a subject expert on the topic Malaria for one hour. The participants were intimated regarding the topic in advance. The lecture was full-fledged covering all the subtopics of malaria using a PowerPoint presentation. An MCQ test of 20 questions for 20 marks was conducted after the lecture, and their opinions gathered, voluntarily given, about traditional lecturing regularly followed in our institution. No formal feedback questionnaire was given to Group I in traditional lecturing.

Group B with 26 students had participated in fishbowl group discussion, on the same topic Malaria for one hour. The participants were intimated regarding the topic three days in advance, and they were prior sensitized about the technique. The whole program was guided by the teacher.

The students for fishbowl were divided into two subgroups, subgroup I and Subgroup II, randomly based on their roll call. Leaders for moderating the discussion and Rapporteurs for noting the key points of the discussion were selected for both the groups. Leaders and rapporteurs were prior informed (3 days in advance) about their roles in the fishbowl, and instructions were given to them as to how the sessions should be conducted. Leaders were also given the list of their participants. Sub-topics for discussion for both the groups were prepared prior under the guidance of the faculty and were given to the respective group leaders. The group leaders assigned the topics to the group members in such a way that all the topics were covered in the discussion, and every participant had got a chance to speak.

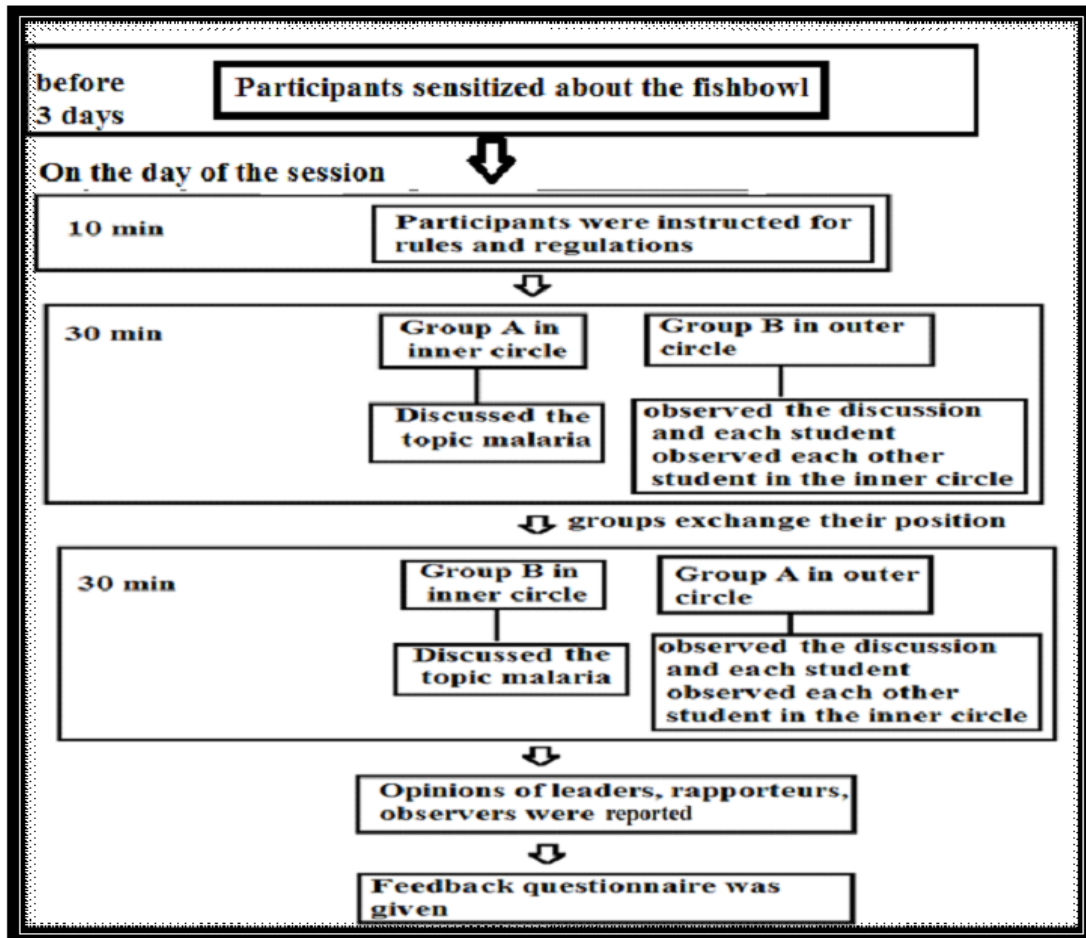
Before the start of the session, both the subgroups were instructed for the procedure, and rules and regulations of fishbowl group dynamics for 10 minutes.

Initially, in the first half of the session (30 minutes), subgroup I in the inner circle discussed actively on the subtopics on malaria including introduction and morphology of the parasite, the life cycle of the parasite and pathogenesis and clinical features, with the leader leading and moderating the discussion. Subgroup II in the outer circle observed the discussion. Each student in the outer circle was assigned one respective student in the inner circle to observe for their communication skills, technical inputs, and behavioral skills. Rapporteur in the group II observed and noted the key points of discussion.

Later on, in the second half of the session (next 30 min), the two groups shifted their positions, subgroup I in the outer circle and subgroup II in the inner circle. Students of subgroup II, now in the inner circle, discussed on the subtopics complications, lab diagnosis and treatment and drug resistance, followed by updates on vaccine production for malarial parasite. Subgroup II was successfully led by their group leader during the discussion. The students of subgroup I in the outer circle observed their respective student in the inner circle for the same skills. Rapporteur of subgroup I observed and noted the key points of discussion during this period. The subject expert did not give any lecture before the fishbowl. It was a discussion supervised by the expert. The study material was the standard textbooks prescribed by the university in Microbiology which they were suggested to refer to.

Finally, group leaders expressed their opinions on the discussion, and rapporteurs conveyed key points of the discussion. Observers' reports were also briefly presented for their respective students.

Fig 1: Fishbowl group dynamics flow chart



After the fishbowl session, an MCQ test with the same questions but in a different order was conducted for 30 minutes. A feedback questionnaire which was prepared by the authors and pre-validated by faculty in the Department of Microbiology was given along with the MCQ test to assess the opinions of participants on fishbowl group dynamics.

The MCQ test scores were assessed and compared

Statistical analysis

The data was fed into MS Excel and assessed using IBM SPSS for Windows Version 22 and verified by SOFASTATS. Mean and Standard Deviations were estimated for variables. Independent t-test was performed to know the significance for both traditional and fishbowl group dynamics. p-value < 0.05 was considered to be significant.

III. Result

The mean scores in MCQ test in traditional teaching were 8.724 ± 3.614 , for a total of 20, and that in fishbowl group dynamics was 10.769 ± 2.875 which was statistically significant with p-value 0.025 ($p < 0.05$) on independent t-test. The fishbowl group dynamics helped in increasing the academic performance of the students, active participation, improvement of communication skills, and better generation of interest in the topic and good retention of knowledge, as opined by the students. Many students also opined that fishbowl was more stressful than a traditional lecture.

Table 1: Mean test scores and comparison

Technique	N (no. of students)	Mean ± SD	95% Confidence Interval	
			Lower Limit	Upper Limit
Conventional teaching technique	29	8.724 ± 3.614	7.409	10.040
Fishbowl Group Dynamics	26	10.769 ± 2.875	9.664	11.874

Table 2: Student responses from feedback questionnaire in fishbowl group

S.No.	Questions	Yes n (%)	Somewhat n (%)	No n (%)	No idea n (%)
1	Were you prior sensitized about the fishbowl technique?	17 (65.38%)	2 (7.69%)	5 (19.24%)	2 (7.69%)
2.	Was the session less stressful?	8 (30.77%)	10 (38.46%)	8 (30.77%)	0 (0%)
3	Was the session interactive?	24 (92.3%)	2 (7.7%)	0 (0%)	0 (0%)
4	Was the time given for the discussion sufficient?	24 (92.3%)	2 (7.7%)	0 (0%)	0 (0%)
5	Was this method useful in increasing the active participation of students in learning?	24 (92.3%)	2 (7.7%)	0 (0%)	0 (0%)
6	Was this method of teaching well in generation of interest regarding the topic?	20 (76.92%)	5 (20.83%)	1 (3.85%)	0 (0%)
7	Was this session useful for good retention of knowledge?	16 (61.54%)	10 (38.46%)	0 (0%)	0 (0%)
8	Was this session useful for improvement of communication skill among students?	24 (92.3%)	2 (7.7%)	0 (0%)	0 (0%)
9	Would you like this method to be continued in future for other topics also	12 (46.15%)	13 (50%)	1 (3.85%)	0 (0%)

IV. Discussion

The main aim of the present study was to find the effectiveness of fishbowl group dynamics over traditional teaching methodology. The mean score achieved in the MCQ test was higher for fishbowl (10.769 ± 2.875) compared to traditional teaching methodology (8.724 ± 3.614), and this was found to be statistically significant with a p-value of 0.025 (p<0.05). The reason for this could be that the students in fishbowl have to prepare accurately for explaining the topic to other students and for answering the questions posed during the discussion, while the students in traditional lecture do not have the necessity to prepare prior due to their passive role.

Table – 3: Opinions of the participants about traditional lecture

Positive comments	Negative comments
Difficult topics can be learned easily in a short time.	With the presence of increasing distractions, listening to monotonous class is difficult.
Clearance of doubts is easier	Concentrating for a lecture for long time is difficult

Table- 4: Opinions of the participants about the fishbowl group dynamics

Positive comments	Negative comments
Independent form of learning: Discussing the topic and learning from friends with joy.	Extra knowledge of the teacher can never be replaced. It can be used as a revision technique
Removes inhibitions among the students and improves interaction	Students with anxiety and tension cannot concentrate on the topic while others are speaking until their turn
Gives chance to think and evaluate the topic in different ways.	Every student works different pace and different way of learning. So all the students may not feel the technique to be interesting.

Not many studies were available in the literature (in education) for comparison with the present study, except for a study by Madhav et al in medical education.

Fishbowl group dynamics helps in the development of communication skills among the students. In a study by Madhav et al., 96.1% of the students agreed that fishbowls were useful in improving communication skills of the students [10]. In the present study, according to 92.3% of the students, participation in small group teaching like fishbowl group dynamics improves the communication skills of the students.

Most of the participants actively contributed their valuable inputs to the discussion in the present study. 92.3% of them opined that fishbowl helped in active participation of students in learning. Some of them were active, bold and confident, while speaking, and few were inaudible.

Most of the students were alert, attentive and responded to the questions which were raised during the discussion. They rationalized the topic with good explanations. This process helps the students to develop a friendly, harmonious environment among the students with complex interactions. 92.3% of participants in the present study opined that the session was interactive. In a study by Madhav et al., 82.5% of the participants agreed that the technique helped in the creation of team spirit and interest in peers [10].

For any technique to be successful, a good cooperative teamwork is essential. And the teamwork largely depends on the team leaders. In the present study, the team leaders had done a great work in designing the discussion and presenting it in a creative way. Fishbowl group dynamics helps in developing team spirit among students.

The ultimate aim of any small group teaching technique is to generate interest among the students towards the topic and then retention of the knowledge for a long term. In the present study, 76.92% of the participants opined that this technique helped in generation of interest towards the topic and 61.54% opined that it helped in good retention of knowledge. In a study by Madhav et al., 91.3% of the students agreed that it helped in better learning [10].

Though small group teaching techniques like fishbowl have many advantages, it may be a stressful session for the students, as opined by 69.23% students in the present study (30.77% completely stressful; 38.46% somewhat stressful). This could be probably because some students may have fear to speak in public or as they have to prior prepare for it. In a study by Madhav et al., 89.3% of the students felt that preparation for fishbowl was a difficult task, and was filled with stress, correlating closely with the present study [10].

In the present study, only 46.15% participants wanted this technique to be conducted in future. This is in contrast to a study by Madhav et al [10], where 83.5% of participants opined that similar techniques should be conducted more frequently. The reason for this could be that the students will have to prior prepare and have to actively participate in the session instead of sitting passively which occurs in traditional lectures.

Despite many advantages over the traditional teaching methodology, fishbowl cannot be used every day in place of routine lectures as it consumes a lot of time, both for the students and the faculty. Students require time for preparation, and there will be concepts which can be better explained by a teacher rather than discussing among students. And if such a discussion is conducted frequently, students may lose enthusiasm and interest towards the discussion leading to failure of the technique. Thus, fishbowl may not be able to replace traditional teaching methodology.

In the curriculum of educational institutions, it is necessary to introduce small group teaching techniques like fishbowl (and others) along with the traditional teaching methodology to generate more interest from the students and make learning joyful. Thus, there should be a mixture of teaching-learning methods rather than be following only a single method, for making education enjoyable rather than a burden.

Limitations of the present study were that both the groups could not be exposed to both the teaching methodologies and then compared due to time constraints for the other regular academic sessions. Also, feedback questionnaire was given only to the students in a fishbowl since it was new teaching method introduced, but traditional lecture methodology was being regularly followed in our institute. Being a small group study, sample size to draw statistical conclusions is not ideal. Also, the duration of the study was small.

V. Conclusion

Fishbowl group dynamics is effective in increasing the academic performance of students. Fishbowl group dynamics helps in active participation, improvement of communication skills, interest generation in the topic and good retention of knowledge. It also helps the sessions to be more interactive.

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