Small Group Learning in Physiology: A Novel Approach to Enhancing Student Learning Outcomes in Competency Based Medical Education (CBME)

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Abstract

Background: Education is a constantly evolving process that must be improved on a regular basis. Medical curricula are insufficient for making significant advances due to lack of innovative teaching techniques in academic settings. Small group learning (SGL) session is an instructional method in CBME curriculum.

Aim: The aim of this study is to reflect students' insights of learning physiology through SGL, which will be beneficial for medical colleges.

Material and Methods: The study was conducted at SSPM Medical College, Padve. A total of 120 students from first year MBBS were included in the study. The participants were asked to rate their level of acceptance with the questionnaire's statements using a Likert scale.

Result: According to the findings, 63% of students strongly agreed that the SGL sessions improved their understanding of the subject. SGL facilitated active learning, according to 58% of students. 63% of students agreed that the outcomes of the session were achieved. Overall learning experience in the SGL was found to be significantly effective.

Conclusion: To conquer the boundaries of traditional teaching on a core science subject, including an participatory learning-teaching, SGL method enhanced participant knowledge regarding the subject, communication skills as well as skills to apply fundamental concepts to clinical situations.

Key words: small group learning, teaching methodology, active learning

Introduction:

In undergraduate education, the impact of teaching has a significant impact on learning outcomes. Choosing an appropriate teaching method is an important step in developing a lesson plan. There are numerous methodologies of teaching used by medical schools to teach undergraduates. Some of the methodologies include seminars, symposiums, lectures, case-based learning, problem-based learning, small group learning (SGL), bedside training, role plays, videos, and so on. In a short period of time, a significant quantity of information is disseminated to a large number of students. However, there are some drawbacks to this. In one of the study, it was observed that, students are merely passive listeners in lectures class. Lectures hardly stimulate students' minds in terms of problem-solving, which is important in their clinical practice[1].

Traditional lecturing typically does not encourage the growth of advanced thinking abilities such as analysis, synthesis, and evaluation, making decision, and problem solving[2]. Nowadays, instead of conventional teacher-centered instructive teaching, the focus is on student-centered approaches that actively involve students in the process of learning[3].

The practical use of fundamental sciences occurs in the university setting through scenario-based small group teaching methods such as team-based learning (TBL), problem-based learning (PBL), and case-based learning (CBL)[4-10].

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According to one study, it was observed that involving students completely in the learning process enhances their curiosity, teamwork skills, self-learning abilities, skill development, knowledge acquisition, and retention rates."[11,12]. Another study found that small group learning can be extremely beneficial for both facilitators as well as learners[13]. Research done by Rehman et al highlights the power of small group interactive sessions, boosting learning outcomes in both traditional and problem-based curricula[14].

The benefits of using the SGL method to teach students include increased understanding, acting as a revision exercise after theory class, enhancing capacity for reasoning, encouraging self-directed learning, and assisting students in developing communication, teamwork, and leadership abilities. Students evaluate the issue, generate possible hypothesis, and contribute to the conversation by providing responses to tasks assigned during SGL sessions.

The researchers of one study emphasize intellectual consistency, or the tutor's ability to convey himself/ herself at the student's level of comprehension. To conduct SGL sessions, the facilitator / tutor must be trained. Students should be encouraged to ask for reasons, feedback, and statements from their tutor. Teachers should play a crucial role in facilitating discussions, intervening when necessary to guide the conversation and stimulate deeper thinking.

The current study was conducted to investigate small group learning as an effective novel teaching learning method in the physiology of CBME curriculum because there aren't many studies that evaluate this approach.

Despite the growing recognition of SGL's effectiveness, there is a paucity of research evaluating its impact within the competency-based medical education (CBME) curriculum, particularly in physiology education. This study seeks to bridge this gap by exploring the effectiveness of SGL in the physiology component of the CBME curriculum. By exploring the effectiveness of SGL in this context, this research will contribute to the existing literature by providing valuable insights into the implementation and outcomes of SGL in CBME, thereby informing evidence-based teaching practices in medical education.

The novelty of this study lies in its focus on the CBME curriculum, which has not been extensively explored in previous research on SGL. The findings of this study will not only add to the existing body of knowledge on SGL but also provide a framework for medical educators to design and implement effective SGL sessions in CBME curriculum, ultimately enhancing student learning outcomes.

This study's contribution to the literature will be significant, as it will: Provide insights into the effectiveness of SGL in CBME curriculum, inform evidence-based teaching practices in medical education, enhance our understanding of the role of SGL in promoting student-centered learning, offer a framework for implementing SGL in CBME curriculum. By investigating SGL in the context of CBME curriculum, this study help bridge the gap in existing research and provide valuable insights for medical educators.

Material and Methods:

This study was conducted on first year MBBS students of SSPM Medical College, Sindhudurg, Maharashtra. An informed written consent was obtained from all students. The physiological systems that would be covered for the preliminary exam were considered as learning modules. Each subunit will have its own set of learning objectives. Students enrolled in the study will be provided with details of learning objectives, study material containing reference books and clinical case scenarios related to the topic covered in sub modules, as well as important questions from previous university examinations related to the module's sub unit a week before the session.

Students will be divided into groups, each consisting of 8-10 members. These groups will meet to discuss important aspects of lectures, clinical cases, and previous year's University examinations. By participating in group discussions, all groups worked on the same questions. Students recall, analyse, and apply prior knowledge to arrive at the final answer in each SGD. Discussions among peers in the group will cover the gaps in understanding and achieve clear understanding. A facilitator observes the group discussions while they are taking place. If the student had any questions, the faculty answered them.

The facilitator chose students at random from the groups to present cases and answer questions. The facilitator's role is to answer any additional questions or address any issues that arose during the discussion.

To specify the respondents' level of agreement with the questionnaire's statements, the responses were gathered on a Likert scale (strongly disagree = 1 to strongly agree = 5). The percentage range of Likert answer items from student recordings was used to compute and analyze.

Results:

Table 1: Small group learning response by students 1 (strongly agree), 2 (agree), 3(no opinion), 4 (disagree), 5 (strongly disagree)

Sl.	Subject	1	%	2	%	3	%	4	%	5	%
1	Understanding of the subject was better	75	63	41	34	1	1	1	1	1	1
2	Facilitated in active learning	70	58	47	39	1	1	1	1	1	1
3	Communication skills were encouraged	76	63	40	33	2	2	1	1	1	1
4	Is your group accomplishing its mission and purpose	75	63	40	33	1	1	1	1	2	2
5	Important points were clarified	75	63	41	34	1	1	1	1	1	1
6	Punctuality of session	65	54	50	42	1	1	1	1	2	2
7	Environment was relaxed	70	58	46	38	2	2	1	1	1	1
8	For higher level of thinking higher level of questions were put to them	72	60	45	38	1	1	1	1	1	1
9	Constructive feedback to individuals were given	72	60	42	35	1	1	2	2	2	2
10	Facilitate guided the students to healthy debate	70	58	45	38	2	2	1	1	1	1
11	For higher level of thinking appropriate question were put to them	65	54	51	43	1	1	1	1	1	1
12	Appropriate balances was maintained in discussion	70	58	45	38	1	1	2	2	1	1
13	Outcome of the session were achieved	75	63	41	34	1	1	1	1	1	1
14	Objective were clear	70	58	46	38	1	1	2	2	1	1

Our study revealed overwhelmingly positive feedback from students: Around 97% reported better understanding of the subject through SGL sessions, 97% appreciated active learning, 98% valued facilitator-guided debates, 96% highlighted effective communication and timely sessions, 96% confirmed that clear objectives were met.

Nearly more than half of the students agreed that the facilitator very well guided the student for a healthy debate, almost all the students summarized the session and 97% students agreed that the outcome of the group learning was achieved. All the students provided active feedback.

Discussion:

The goal of this study was to determine the effectiveness and satisfaction provided by small group learning in teaching physiology to first-year MBBS students. Students benefited from SGL sessions in terms of meaningful learning. In our study active and interactive small group learning cleared the concepts of the topics. Similar to our study, other studies have also shown that small group learning is an extremely effective teaching tool, and observed that majority of the loopholes that were overlooked during didactic teaching were being addressed during these sessions[15].

Since the group is small, every student obtains personalized attention, making him feel valued. Even without prior knowledge, students can learn from peers, identify knowledge gaps, and pinpoint areas for improvement through collaborative discussions[16].

Sometimes only one or two overly enthusiastic students interact with the teacher, preventing other students from participating, but our study ensured all students had an equal opportunity to participate.

Students were exposed to various modes in this SGL, including reading (in preparation for the actual SGL), writing and spoken activities (class discussion, presentation). The rate and time frame were determined by repetitions in reading, discussions, and exposure to SEQs. Long-term retention has been shown to improve with repeated assessment and recall.

The findings of this present study demonstrate the effectiveness of small group learning (SGL) in enhancing student engagement and understanding in physiology education. Our results are consistent with previous research that has shown SGL to be a valuable teaching tool in medical education[1, 4-7]. The interactive nature of SGL allows students to clarify concepts, identify knowledge gaps, and develop essential skills such as communication, teamwork, and problem-solving[8-10].

One of the key benefits of SGL is its ability to promote active learning and student engagement. Research has shown that active learning approaches, such as SGL, are more effective than traditional lecturing in promoting student learning outcomes[2,11]. Our study's findings support this, with students reporting increased satisfaction and engagement with SGL sessions. The role of the facilitator in SGL is crucial, and research has highlighted the importance of creating

a supportive and inclusive learning environment[13]. In our study, facilitators played a key role in guiding discussions, providing feedback, and encouraging student participation. This is consistent with previous research that has shown the importance of facilitator training and support in SGL[13,14].

Our study's findings also highlight the benefits of SGL in promoting peer-to-peer learning and support. Students were able to learn from one another, share knowledge, and develop a sense of community[15,16]. This is consistent with previous research that has shown the benefits of peer-assisted learning in medical education[16].

The findings of this study have implications for medical education, particularly in the context of competency-based medical education (CBME) curriculum. SGL can be a valuable tool in promoting student-centered learning, improving knowledge retention, and developing essential skills. Medical educators can incorporate SGL into their teaching practices, using facilitators to guide discussions and promote student engagement.

Overall, our study's findings demonstrate the effectiveness of SGL in physiology education and highlight its potential as a valuable teaching tool in medical education. By incorporating SGL into their teaching practices, medical educators can promote student-centered learning, improve knowledge retention, and develop essential skills in their students.

Conclusion:

Small group sessions appear to be the best educational method for students. Students focused the importance of small group learning method in physiology to promote understanding of the subject, fascination, an improved comprehension of the subject, as well as correlating physiological concepts in the context of clinical cases in their questionnaire responses. Similarly, they emphasized the importance of developing good communication skills, leadership and teamwork abilities, value of constructive as well as positive feedback, and finally, the best way to sum up and conclude a session.

Limitations and Future Directions

The main limitation of this strategy is the need for an optimal student-teacher ratio, and this necessitates the hiring of a larger staff. In addition, unprepared groups lead to inefficient SGL that may be mitigated by assigning grades on performance. While our study's findings are promising, there are limitations that need to be considered. Further research is needed to explore the long-term effects of SGL on student learning outcomes and to identify strategies for implementing SGL in resource-constrained settings. Additionally, our

study highlights the importance of facilitator training and support in SGL, and further research is needed to explore the impact of facilitator training on student learning outcomes.

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