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UNCLE (Unconventional Learning Exercises): An Innovative approach towards active learning in Physiology for I MBBS students

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ABSTRACT

Objectives: Physiology is a constantly evolving subject; hence, it demands participation from the students for effective learning. In the current trend of medical education, medical teachers need to accumulate a good knowledge of efficient "Teaching–Learning Methods," that enable active student participation. "UNCLE–Unconventional Learning Exercises" is one such approach that facilitates learning through discussions with colleagues and helps in acquiring facts through "Participatory learning" rather than through rote memory.The present study aimed to assess the effectiveness of an active learning method "UNCLE" in learning physiology among I MBBS students.

Materials and Methods: Thirty I MBBS students were exposed to "Unconventional Learning Exercises" in small groups during the regular tutorial sessions. The study tools used for "UNCLE" were worksheets with critical thinking questions and analogies shown in flash cards. Pre- and post-test scores were obtained for the evaluation of their learning. Feedback was obtained from the students to elicit their perception about the effectiveness of the new method.

Results: The post-test scores (7.7 ± 1.37) were significantly greater than the pre-test scores (6.24 ± 1.57). The students reported the method to be innovative, interesting, refreshing, and more engaging. They reported that this method enhanced team-work and improved their communication skills.

Conclusion: UNCLE may be considered an effective active learning strategy in physiology for I MBBS students.

Keywords: Active learning, Physiology, Unconventional learning exercises

INTRODUCTION

Medical physiology is a constantly evolving subject, where conceptual learning plays a major role in the acquisition and application of knowledge.[1] This imposes a major challenge on the teachers in devising active learning strategies that activate the critical thinking of the students and facilitate the retention of knowledge.[2]

Implementation of "Competency-Based Medical Education" (CBME) in undergraduate medical curriculum in India has posed greater demand for the adoption of student centric methods.[3] A descriptive literature review on modern techniques of teaching and learning in medical education emphasized the importance of bridging the gap between traditional methods and student expectations.[4]

Active learning techniques that improve student participation, concept understanding, and long-term retention need to be integrated with the traditional methods.[5,6] The literature search revealed various active learning strategies that enhance the active participation of students.[6,7]

"Unconventional Learning Exercises" (UNCLEs) in the form of quizzes, debates, and role-plays have been proven to be effective in providing a student-centric environment in learning biochemistry. UNCLE facilitates learning through discussions with colleagues and facts are acquired through participatory learning.[8]

Hence, the present study aimed at assessing the acceptability and the effectiveness of the "Unconventional Learning Exercises" in learning physiology among 1-year medical undergraduates.

MATERIALS AND METHODS

Study setting

This study was Department of Physiology, Sri Manakula Vinayagar Medical College and Hospital.

Study participants

Sample size is 30 1-year medical undergraduates.

Study design

This study was cross-sectional study.

Ethical approval

The Institutional Ethics Committee permission was obtained.

Methodology

The entire batch of 150 medical undergraduates was exposed to the selected topic in General Physiology (Concepts of Homeostasis and Transport of substances across the cell membrane) through conventional didactic lecture. In the same week, during the regular tutorial session, "Pretest" was administered in the topic. A group of 30 students were initially exposed to the "UNCLE." The students were divided into six groups with five members in each group and were facilitated by a faculty throughout the interactive session. "Unconventional Learning Exercises" were administered in the form of worksheets with critical thinking questions and flashcards with analogies. Few analogies were created by the senior students that were used as educational resources. At the end, there was a random presentation by the students on the "Unconventional Exercises." Following exposure to UNCLE, at the end of the session, a post-test was administered to the students. We made the "UNCLE" interesting using the analogies created by their senior students as educational resources during the exercises. It was decided to expose the rest of the students to "UNCLE" in rotation.

The acceptability of this method among the students was assessed using a validated self-administered feedback questionnaire with open-ended questions.

Statistical analysis

Descriptive statistics (mean ± standard deviation) was used for expressing the pretest and posttest scores. The Statistical Package for the Social Sciences version 22 was used for statistical analysis. The pre-test and the post-test scores were compared using student *t*-test. Manual content analysis was done for the open-ended questions.

RESULTS

There was a statistically significant improvement in the post-test scores after the exposure to the "Unconventional Learning Exercises," as depicted in [Table 1].

[Table 2] represents the summary of responses obtained from the students on their learning experience individually and in a team and on the qualities, they perceived to have acquired after exposure to UNCLE, after categorization by manual content analysis.

[Table 3] represents the summary of responses obtained from the students on the merits and the demerits of the learning experience through "UNCLE."

DISCUSSION

CBME curriculum has demanded the adoption of active learning strategies by the faculty.[3] The term "UNCLE" was coined by the BP Koirala University of Health Sciences, a residential university in Nepal. UNCLE in the form of a quiz, debate and other forms of small group discussions have been found to enhance the learning skills of medical students.[8] The present study assessed the acceptability of "UNCLE" as an active learning strategy among the 1-year medical students in learning physiology, and also, its effectiveness was assessed with pre- and post-test scores, which was found to be statistically significant.

The response obtained from our students on their perception of the novel method "UNCLE" clearly depicts their positive

Table 1: Comparison of the pre-test and post-test scores after exposure to UNCLE.

N	Pre-test	Post-test	*P*-value
30	6.24±1.57	7.7±1.37	<0.01

Values expressed in mean±standard deviation. UNCLE: Unconventional learning exercises

Table 2: Perception of the students on "UNCLE."

Questions	Comments by the students
Share your learning experience	- Favoured long-term retention - Innovative, interesting and easy learning, quick, interactive learning, enjoyed the learning process - Refreshing knowledge, Hidden points in the book are discovered
What were the new qualities acquired?	- Concept understanding - Referral habits, self-realization - Self-confidence - Communication skills - Team work, gentleness, and responsibility - Integration of learnt information with other subjects
Share your experience in the team	- Listening to others - Gained new information on same topic - Needed good co-ordination - Quick learning - Platform for receiving different views from different people regarding the same picture

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Table 3: Students perception on the merits and demerits of UNCLE.

Questions	Comments by the students
What were the merits?	- Hard ideas learnt easily - Elaborate understanding of a topic - Ignites self-learning
What were the demerits?	- Needs interest and dedication - Lack of team co-ordination

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attitude toward the innovative active learning strategies. Similar results were observed in the studies by Leksuwankun *et al.* and Walling *et al.*[9,10]

The students expressed good concept understanding, communication skills, and ability to work in a team as some of the qualities acquired during the "Unconventional learning exercises." Similar results were reported by Powell *et al.* with administration of mini-quizzes and self-framing of MCQs by students.[11]

Analogies were used in our study for depicting the physiological concepts which were well-appreciated by students and enhanced their critical thinking capacity. Similar results were reported by Pamidi in teaching anatomy for the students.[12]

However, active learning strategies are not free of limitations, as expressed in the feedback by our students. It requires good team work and a good coordination among the students. The development of resources will be time consuming as expressed by Chakraborty.[13]

Despite the limitations, the advantages of this active learning strategy outweigh its demerits, as expressed by the students. The strength of our study is the utilization of the exercises created by the students as educational resources during the activity. The mixed method of the study added weightage to the evaluation process. However, our study is not free of limitations like small sample size and we attempted only to study the reaction and the learning aspects of the students which correspond to lower levels of Kirkpatrick evaluation.

CONCLUSION

UNCLEs may be considered an effective active learning strategy in physiology for I MBBS students. They may be integrated with conventional methods during the tutorial sessions to enhance student learning and engagement.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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