

Original Article

Study of Effectiveness of Self-directed Learning Compared to the Traditional Method of Learning for Undergraduate Medical Students

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Background : Competency-based Medical Education (CBME) is giving emphasis on a learner-centric approach for medical students rather than a teacher-centric approach. Self-directed Learning (SDL) is a learning process where the learner takes responsibility for their own learning process. Though it is an active learning process and encourages health professionals to be lifelong learners, very few studies have been done on SDL. Therefore, this study aimed to find out the effectiveness of implementing SDL in the undergraduate medical students curriculum.

Material and Methods : The study included 200 undergraduate medical students. A questionnaire was used to obtain the perception of students on SDL. Pre-test and post-test were carried out before and after the traditional lecture and SDL and the effectiveness of SDL was found by statistically comparing the test values.

Result : The students showed a positive perception toward SDL. The students scored significantly higher marks in the pre-test compared to the post-test marks. The post-test marks of the SDL session were significantly higher than the post-test marks of the lecture session.

Conclusion : We concluded from our study that SDL is an effective learning method and can be adopted as a teaching-learning method along with the traditional method of learning.

[J Indian Med Assoc 2024; 122(10): 60-3]

Key words : SDL, Learner-centric, CBME, Undergraduate Students.

The Medical Council of India (MCI) recommended implementing Competency-based Medical Education (CBME) curriculum for medical students in 2019¹. In this learner-centric approach, the main focus of CBME is on acquiring competencies as endpoints to produce competent doctors. One of the goals of Indian Medical Graduates is to become lifelong learner² and to achieve it, students should be motivated from within to learn. Self-directed Learning (SDL) is a self-driven method to reach objectives. It is a learning process where the learners consciously accept responsibility in andragogy. Compared to the didactic lecture, SDL is a powerful and active learning method³. SDL is one of the important learning parameters in Health Professions studies. SDL has been widely adopted to educate medical and other healthcare professional students worldwide⁴. It encourages Health Professionals to update their knowledge and continue their learning process during their careers to deal with the ever-

Editor's Comment :

- Competency-based Education for medical students includes newer concepts like Self-directed Learning (SDL).
- SDL is an active form of learning where the learner takes responsibility for his/her learning process. This learning process promotes "deep learning" and "lifelong learning" as it kindles interest in the subject and helps in critical thinking. So, this form of teaching must be meticulously planned and implemented in the medical curriculum with the view of producing competent Indian Medical Graduates (IMGs).

challenging healthcare environment⁵. Researchers have found that SDL is an effective methodology for learning in medical schools^{6,7}. Because of these emerging trends on student-centric learning techniques and the limited research done related to the effectiveness of SDL, we planned this study. The main objective of this study was to find out the effectiveness of implementing Self-directed Learning techniques to study Physiology for 1st year medical students. To achieve this objective, a learning format was designed to give the students an interesting approach to study without deviating from the regular didactic lecture classes.

MATERIAL AND METHODS

A batch of 250 MBBS Phase-I students were included in the study. Out of the 250 students, 200 students who volunteered to participate were included as study participants. The study was started after

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Received on : 23/08/2023

Accepted on : 26/08/2023

obtaining ethical clearance and consent from each student. The study was carried out in two parts.

The First part was to compare the two forms of teaching, ie, conventional teaching through didactic lecture and SDL. Two topics from Respiratory Physiology were included for conventional teaching and SDL session separately. The 'Neural regulation of respiration' was taken through didactic lecture and the 'Chemical regulation of respiration' was given to the students for SDL. A pre-test was given to the students before didactic lecture. The didactic lecture was taken for all the 200 students in the theory class for 45 mins then the post test was conducted. A pre-test was conducted before SDL session. The SDL session was conducted in 10 small groups of 20 students each in the lecture theater with the teacher as the facilitator. The students were explained regarding SDL and they were provided with study materials like links to relevant PubMed articles, video links and references of standard textbooks of Physiology as resource materials. They were asked to read the topic assigned from the resources provided to them and prepared on the topic in the class for 45mins. Thereafter assessments of SDL session was done by a post-test. The pre-tests and post-tests involved 10 MCQs each (each set to be answered in 10 minutes) for a maximum of 10 marks per set. The MCQ papers were collected and evaluated manually with no negative marking and the results were tabulated.

Then in the second part of the study, a pre-validated questionnaire was used to obtain students' perception towards both the teaching method and findings were expressed as percentages and were compared graphically⁸.

Statistical analysis : The data obtained was analysed using SPSS version 22 software. Students' pre-test and post-test were tabulated and compared. P value <0.5 was considered significant. Perception analysis of the students was done by calculating frequencies with percentages for all responses and was represented graphically.

OBSERVATIONS

On analysis of the pre-test and post-test marks before and after the conventional didactic lecture and SDL session it was found out that, there was no significant difference in the mean pre-test marks of conventional lecture (5.0 ± 2.0) and SDL (5.2 ± 1.6) with p-value 0.17 (Table1). The mean post-test marks following lecture class (6.3 ± 1.4) was significantly higher p-value <0.001) than the mean pre-test marks (5.0 ± 2.0) (Table 2). The mean post-test marks

following SDL (6.9 ± 1.2) were significantly higher (p-value <0.001) than the mean pre-test marks (5.2 ± 1.6) (Table 3). The mean post-test marks (SDL) (6.9 ± 1.2) were significantly higher (p-value <0.001) than the mean post-test marks following the lecture (6.3 ± 1.4) (Table 4). Out of the 200 students who participated in the study majority agreed that SDL is more interesting, more satisfying than the conventional didactic lectures, it makes them more confident in applying clinical knowledge, they are more enthusiastic and SDL makes the learning process easier for them (Fig 1). Further, the students also agreed that SDL generates curiosity, and motivates them to learn but at the same time they agreed that SDL demands more effort from the students and the role of teacher is very important in this process (Fig 2).

DISCUSSION

Most of the subjects in basic science are taught by didactic lectures. This teaching method is mainly teacher-centric and the students lose their thinking and analytical ability. Basic science teaching is thought to be dry and uninteresting by students who think it is not 'directly' related to their career as practising healers and doctors in future⁹. In this type of teaching, emphasis is given only to acquiring knowledge only. However, the recently introduced CBME curriculum for undergraduates de-emphasizes such teaching. There have been a lot of inclusions in the CBME with a vision of producing competent doctors. One such inclusion is SDL.

In SDL, the medical students take the initiative to

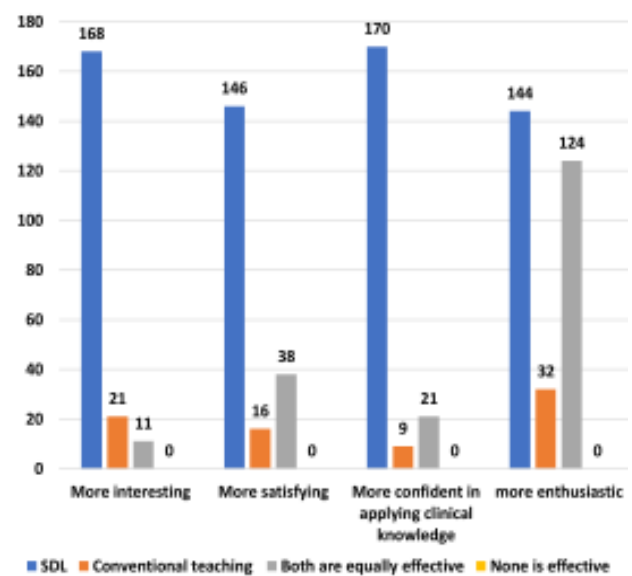


Fig 1 — Comparison of students' perception of SDL and conventional teaching method

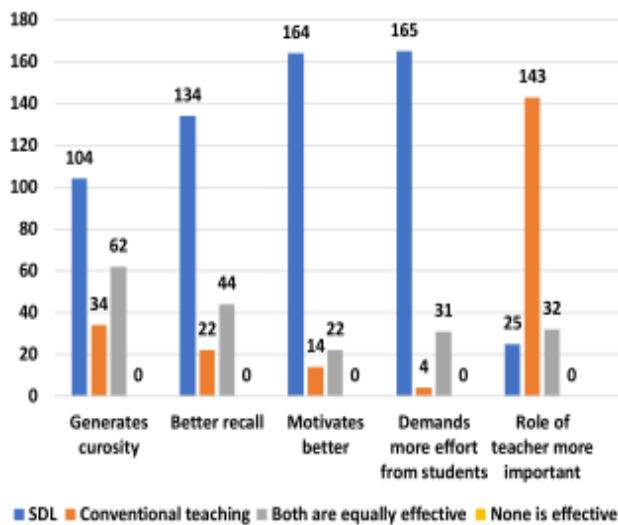


Fig 2 — Comparison of students' view about SDL and conventional teaching method

learn, with or without the help of instructors or teachers, set learning goals, determine their learning needs, choose and implement learning strategies to acquire knowledge identify resources for learning and finally evaluate learning outcomes¹⁰.

Our study was an attempt to find out the effectiveness of implementing SDL in the medical undergraduate curriculum by pre and post-tests following lecture and SDL session. We found out that, though there was no significant difference in the pre-test marks of the students with both methods of learning (lecture and SDL) (Table 1). The pre-test marks were higher than the post-test marks of both the methods of learning (Tables 2,3). However, the post-test marks of SDL session was significantly higher than the post-test marks of didactic lecture class (Table 4). Our study agrees with the findings of Arunima Chaudhuri, *et al*¹¹ who also showed that students performed better in the post SDL session compared to post lecture session. So, SDL is an effective method of learning for undergraduate students and can be preferred over didactic lecture in teaching certain topics.

According to researchers, SDL is an individual's attitude towards learning, where they decide at what depth and breadth they need to learn¹². They prepare their own learning goals, find reading material and implement the right learning strategies, which is in contrast to conventional teaching where a teacher delivers to a large audience of students¹³. This process of dynamic learning aims to help medical graduates to take initiative in solving their learning problems and to become lifelong learners¹⁴. As per

our study majority of students find SDL to be more interesting, more satisfying; by SDL, they are more confident in applying clinical knowledge, they are more enthusiastic in learning, it is easier learning with SDL, it generates curiosity in them, better recall possible by SDL, it motivates students better however it demands more effort from students (Figs 1&2). Our findings are similar to the findings of Poonam Agrawal, *et al*⁸. Knowles stated SDL as a dynamic process where the learner instills new experiences, co-relate present and previous experiences and identifies current experiences¹⁵. Candy said that in SDL, students acquire the ability to perform activities that is helpful for them to control their learning¹⁶. SDL is generally defined as "learning on one's own initiative, with the learner having primary responsibility for planning, implementing, and evaluating the effort"¹⁷. SDL has been considered as an important tool for life-long learning, which is an integral part of a medical doctor's professional life; so, SDL method is increasingly being promoted from the early phases of Medical College¹⁸.

The present medical curriculum give emphasis on active learning and hence, this requires greater involvement of faculty members but the availability of faculty members is posing a huge challenge¹⁹.

Mean Pre-test marks (Lecture) ± SD	Mean Pre-test marks (SDL) ± SD	p-value
5.0 ± 2.0	5.2 ± 1.6	0.17

Mean Pre-test marks (Lecture) ± SD	Mean Post-test marks (Lecture) ± SD	p-value
5.0 ± 2.0	6.3 ± 1.4	<0.001**

Mean Pre-test marks (SDL) ± SD	Mean Post-test marks (SDL) ± SD	p-value
5.2 ± 1.6	6.9 ± 1.2	<0.001**

Mean Post-test marks (Lecture) ± SD	Mean Post-test marks (SDL) ± SD	p-value
6.3 ± 1.4	6.9 ± 1.2	<0.001**

CONCLUSION

Our study concludes that students' performance is increasing with SDL and also, the students have a positive attitude towards SDL, so it can be considered as an alternate form of learning in acquiring knowledge. SDL is certainly an effective mode of teaching certain topics in Physiology. SDL should not supplement the traditional teaching approach rather, SDL sessions could cover only a few topics from the total content areas in the curriculum of the 1st year MBBS programme. Implementation of SDL should not be a challenge; wisely and timely planned SDL can be a boon for teaching more effectively and fascinatingly.

Limitations of our Study : our study was a short-duration study. A study of longer duration with a wide-ranging content area needs to be done to ascertain the impact of SDL on traditional curricula.

Funding : Nil

Conflict of interest : Nil

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