

Original Research Article

Assessment of self-directed learning abilities among medical undergraduates in a government medical college of Nagpur: a cross-sectional study

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ABSTRACT

Background: Self-directed learning (SDL) is an essential component of competency-based medical education (CBME) and plays a vital role in promoting lifelong learning among medical students. The National Medical Commission has emphasized SDL as a key strategy to develop independent learning, critical thinking, and professional competence among undergraduate medical students. The present study was conducted to assess self-directed learning abilities among medical undergraduates at a Government Medical College in Nagpur.

Methods: A cross-sectional study was conducted among second professional undergraduate medical students of Government Medical College, Nagpur from October to December 2025. A universal sampling technique was adopted, and participation was voluntary. Data were collected using the pre-validated self-directed learning instrument (SDLI) developed by Shen et al consisting of 20 items across four domains: learning motivation, planning and implementation, self-monitoring, and interpersonal communication. participants' responses were obtained using a 5-point Likert scale. Data were analyzed using descriptive statistics in Jamovi software version 2.6.44.

Results: Out of 250 students approached, 174 completed the questionnaire, yielding a response rate of 69.6%. The overall SDL score was 72.1%, indicating a moderate level of self-directed learning ability among the participants. Among the four domains, the highest percentage score was observed in learning motivation (75.7%), followed by interpersonal communication (72.4%), self-monitoring (71.4%), and planning and implementation (68.6%).

Conclusions: The study demonstrated that medical undergraduates possessed moderate level of self-directed learning abilities, with strong learning motivation but comparatively lower scores in planning and implementation.

Keywords: Self-directed learning, SDLI, Medical undergraduates, Competency-based medical education, Medical education

INTRODUCTION

Modern medical education is undergoing a profound transformation, shifting from traditional, teacher-centered pedagogy toward active, student-centered approaches.^{1,2} This evolution is driven by the rapidly changing landscape of medical knowledge and evolving healthcare challenges, which necessitate that physicians become active, lifelong learners.³⁻⁵ In India, the national medical

commission (NMC) has underscored this need by integrating "lifelong learner" as a core competency for every Indian medical graduate.⁵⁻⁷

Consequently, traditional passive learning, which often leaves students feeling overburdened by rote memorization, is being replaced by strategies that encourage the application of knowledge.^{2,7} SDL is a cornerstone of this educational reform. It is defined as a

process where individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate goals, identify resources, choose appropriate learning strategies, and evaluate their own learning outcomes.^{8,9}

Unlike traditional "self-study," SDL involves a shift in the "locus of control," where the learner takes responsibility for the direction and implementation of their education while the teacher acts as a facilitator.^{3,4,9,10} The implementation of CBME has made SDL an essential educational principle.^{4,10}

Dedicated time is now mandatory for SDL within each specialty of the undergraduate curriculum to help students develop key professional attributes, including independent learning skills, accountability, assertiveness, and responsibility.^{3,10}

Furthermore, SDL is rooted in the development of critical thinking, problem-solving, and analytical reasoning.^{6,9,11} By fostering autonomy and curiosity, it prepares students to navigate complex healthcare issues and adapt to the rapidly evolving medical field.^{1,11}

Despite the mandatory inclusion of SDL in the CBME curriculum, a significant knowledge gap remains and evidence from Government Medical College, Nagpur is limited; therefore, this study aimed to assess SDL abilities among medical undergraduates in this setting.

METHODS

Study design and setting

A cross-sectional study was conducted among second professional undergraduate medical students of Government Medical College, Nagpur.

Study duration

The study was conducted from October to December 2025.

Study participants and sampling technique

All second professional undergraduate medical students who were willing to participate were included in the study. A universal sampling technique was adopted.

Data collection

All second professional undergraduate medical students who were willing to participate were included in the study using a universal sampling technique. Participation was entirely voluntary.

The details and objectives of the study were explained to all participants prior to data collection, and informed consent was obtained electronically from each participant

before enrollment in the study. Strict confidentiality and anonymity of the participants were maintained throughout the study period.

Students with incomplete or invalid responses were excluded from the final analysis to ensure the reliability and accuracy of the data. A total of 250 students were approached to participate in the study, out of which 174 students completed the SDLI, yielding a response rate of 69.6%.

Study tool

The study utilized the SDLI, a pre-validated questionnaire developed by Shen et al.¹² It comprised 20 items in total the first 6 items assessed learning motivation, items 7 to 12 focused on planning and implementation abilities, while 13 to 16 self-monitoring domain and remaining items 17 to 20 evaluated interpersonal communication skills. Each item was rated on a 5-point Likert scale, where: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

Data analysis

Data were exported from Google Forms into Microsoft Excel and analyzed using Jamovi statistical software (version 2.6.44). Descriptive statistics such as mean, standard deviation, percentages were used to summarize the data.

The SDLI scores were calculated by summing the item scores within each domain, as well as the total scores for all domains combined. categorized into low (<60), moderate (61-80) and high (>80).

Ethical considerations

Ethical approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Informed consent was obtained from all participants.

RESULTS

A total of 250 second professional undergraduate medical students were approached to participate in the study. Among them, 174 students completed the SDLI, yielding a response rate of 69.6%.

The mean scores of the individual SDLI items across the four domains are presented in Table 1.

Within the learning motivation domain, the highest mean score was observed for the statement "I strongly hope to constantly improve and excel in my learning" (4.01), indicating a strong intrinsic motivation toward learning among the participants. Other items in this domain also demonstrated favorable responses, with mean scores ranging from 3.56 to 3.87.

Table 1: Mean scores for SDLI items of the respondents (n=174).

S. no.	Items	Mean score
1. Learning		
Q1	I know what I need to learn	3.67
Q2	Regardless of the results or effectiveness of my learning, I still like learning	3.56
Q3	I strongly hope to constantly improve and excel in my learning	4.01
Q4	My successes and failures inspire me to continue learning	3.86
Q5	I enjoy finding answers to questions	3.87
Q6	I will not give up learning because I face some difficulties	3.75
2. Planning and implementation domain		
Q7	I can pro-actively establish my learning goals	3.59
Q8	I know what learning strategies are appropriate for me in reaching my learning goals	3.44
Q9	I set the priorities of my learning	3.63
Q10	Whether in the clinical practicum, classroom or on my own, I am able to follow my own plan of learning	3.33
Q11	I am good at arranging and controlling my learning time	3.14
Q12	I know how to find resources for my learning	3.46
3. Self-monitoring domain motivation domain		
Q13	I can connect new knowledge with my own personal experiences	3.67
Q14	I understand the strengths and weakness of my learning	3.63
Q15	I can monitor my learning progress	3.52
Q16	I can evaluate on my own my learning outcomes	3.47
4. Interpersonal communication domain		
Q17	My interaction with others helps me plan for further learning	3.74
Q18	I would like to learn the language and culture of those whom I frequently interact with.	3.70
Q19	I am able to express messages effectively in oral presentations	3.37
Q20	I am able to communicate messages effectively in writing.	3.68

Table 2: SDLI scores within each domain.

Domain	Percentage score
Learning motivation	75.70
Planning and implementation	68.60
Self-monitoring	71.40
Interpersonal communication	72.40
Overall	72.10

In the planning and implementation domain, comparatively lower mean scores were observed. The highest score in this domain was for “I set the priorities of my learning” (3.63), whereas the lowest mean score among all SDLI items was reported for “I am good at arranging and controlling my learning time” (3.14). This suggests that students experienced relatively greater difficulty in time management and implementing structured learning plans.

Within the self-monitoring domain, the mean scores ranged from 3.47 to 3.67. The statement “I can connect new knowledge with my own personal experiences” recorded the highest mean score (3.67), reflecting satisfactory reflective learning practices among students. In the interpersonal communication domain, students reported relatively favorable communication abilities.

The highest mean score in this domain was for “My interaction with others helps me plan for further learning” (3.74), while the lowest score was observed for “I am able to express messages effectively in oral presentations” (3.37) (Table1). The domain-wise percentage scores of SDL abilities are shown in Table 2. The highest percentage score was observed in the learning motivation domain (75.7%), followed by interpersonal communication (72.4%), self-monitoring (71.4%), and planning and implementation (68.6%). The overall SDL score among the participants was 72.1%, indicating a moderate level of self-directed learning ability among the study participants (Table 2). The distribution of SDL abilities among the students is depicted in Figure 1. Most participants demonstrated moderate levels of self-directed learning ability, while comparatively fewer students were categorized into low and high SDL groups (Figure 1).

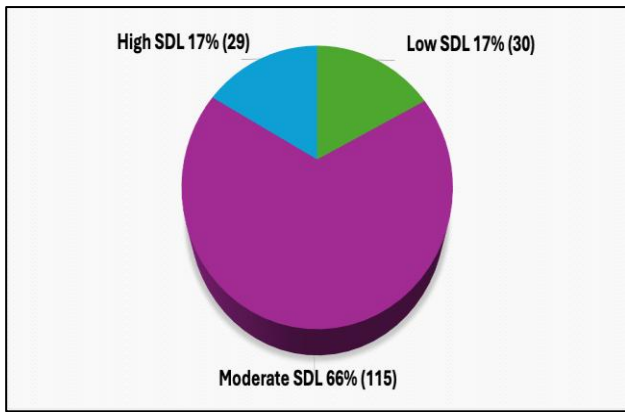


Figure 1: Distribution of SDL abilities of students (n=174).

DISCUSSION

The current study was undertaken to evaluate the SDL abilities of second professional medical undergraduates at Government Medical College, Nagpur, utilizing the standardized SDLI. The present study assessed SDL abilities among undergraduate medical students using the SDLI. The overall SDL score of 72.1% observed in the present study indicates a moderate level of self-directed learning ability among the participants. Among the individual domains, the highest percentage score was observed in learning motivation (75.7%), followed by interpersonal communication (72.4%), self-monitoring (71.4%), and planning and implementation (68.6%).

These findings suggest that students possessed favorable intrinsic motivation toward learning, although comparatively lower scores in planning-related domains indicate the need for structured guidance and support. Similar findings were reported by Yadavalli et al who observed an overall moderate-to-high SDL ability among first-year MBBS students using the SDLI tool.⁸ Their study also identified Learning Motivation as the highest-scoring domain, suggesting that medical students are generally well motivated toward autonomous learning within the CBME framework. Likewise, Govindharaj et al and Swaminathan et al reported high SDL abilities among allied health sciences students, with strong scores in motivation and self-monitoring domains.¹¹ The consistency of these findings across studies may be attributed to the increasing emphasis on learner-centered approaches and lifelong learning competencies under the CBME curriculum introduced by the NMC.

In the present study, the learning motivation domain achieved the highest score. Comparable findings were also reported by Bhandari et al who found that students scored high in most SDL skills, particularly in motivation-related components.⁴ High motivation among medical students may be explained by their professional aspirations, competitive academic environment, and increasing awareness regarding the importance of lifelong learning in medicine. Motivation is considered a core

component of SDL, as emphasized by Shen et al who identified motivation, self-monitoring, planning, and communication as the four principal domains of SDL.¹²

The comparatively lower score observed in the planning and implementation domain in the present study is consistent with previous literature. Govindharaj et al and Swaminathan et al also reported relatively lower scores in planning and implementation compared to other SDL domains.¹¹ Similarly, Bhandari et al observed that students experienced difficulty with time management and identification of appropriate learning resources.⁴ These findings may reflect the challenges faced by undergraduate students while transitioning from traditional teacher-centered learning during school education to self-directed approaches in medical education. Limited prior exposure to independent learning strategies, along with a heavy academic workload, may also contribute to these challenges.

The present study also demonstrated satisfactory scores in interpersonal communication and self-monitoring domains. Effective communication and reflective learning are essential components of SDL and contribute significantly to collaborative learning and professional development. Studies by Singh et al and Wawage et al similarly highlighted that SDL promotes critical thinking, communication skills, and independent learning habits among medical students.^{1,6} However, certain studies have reported difficulties related to communication skills among students, especially in confidently expressing their views and actively participating in discussions. This indicates the need for educational strategies such as peer learning, mentorship, and small-group discussions to strengthen communication competencies. The findings of the present study support the growing recognition of SDL as an important component of undergraduate medical education. SDL encourages active participation, improves critical thinking, and prepares students for lifelong learning, which is essential in the rapidly evolving medical field. Krishnan et al emphasized that SDL enhances autonomy, reflective practice, and continuous professional growth among medical undergraduates.⁵ Similarly, Shrivastava et al highlighted that successful implementation of SDL requires active faculty facilitation, structured planning, and continuous mentoring rather than mere self-study.³

Overall, the findings of the present study suggest that medical students demonstrated moderate SDL abilities, with higher scores observed in the domains of learning motivation and interpersonal communication, whereas comparatively lower scores were noted in planning and implementation skills. The overall SDLI score indicates that although students are motivated and capable of monitoring their own learning, they may require additional guidance in organizing, planning, and effectively implementing self-learning strategies. These findings highlight the need for strengthening structured SDL activities within the CBME curriculum through

faculty mentorship, orientation programs, reflective learning practices, and collaborative teaching methods to enhance students' preparedness for lifelong learning and professional development.

Limitations

The study was conducted in a single institution; therefore, the findings may not be generalizable to all medical colleges. Data were collected using self-reported questionnaires, which may be subject to self-reporting and social desirability bias.

CONCLUSION

The study revealed a moderate level of self-directed learning abilities among medical undergraduates. While students demonstrated strong learning motivation and interpersonal communication skills, comparatively lower scores in planning and implementation highlight the need for structured guidance, mentorship and faculty support to strengthen self-directed learning practices within the curriculum.

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