Research Article

Perceptions, Attitudes, and Challenges Related to Self-Directed Learning Among Undergraduate Medical Students: A Cross-Sectional Study

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Abstract

Background: Self-directed learning (SDL) is a learner-centered educational approach in which students identify learning needs, set goals, select resources, implement learning strategies, and evaluate outcomes. Its incorporation into competency-based medical education requires an understanding of students' readiness, attitudes, and perceived barriers. Objectives: To assess undergraduate medical students' perceptions and attitudes toward SDL and to identify the challenges and perceived benefits associated with its implementation. Methods: A cross-sectional analytical study with quantitative and qualitative components was conducted from June to November 2025 among MBBS students from a medical college in India, with responses obtained from students from several Indian states. A validated, pre-structured 27-item questionnaire was disseminated through WhatsApp groups using Google Forms. Items assessed perceptions (11 items), attitudes (10 items), and challenges or benefits (6 items) on a five-point Likert scale. Open-ended responses were independently reviewed by two authors and thematically analyzed. Quantitative data were summarized using means and percentages in Microsoft Excel. Results: Of 153 responses received, 16 were excluded because of absent consent (n=4) or lack of awareness of the SDL session (n=12); 137 responses were analyzed. Mean age was 19 ± 0.8 years and the male-to-female ratio was 0.7:1. Third-year Part I students constituted the largest academic group (40%), and 65% of respondents were from Maharashtra. Agreement or strong agreement was high for evaluating one's learning outcomes (78.1%), monitoring learning progress (77.4%), establishing learning goals (80.3%), locating learning resources (75.9%), and understanding personal learning strengths and weaknesses (76.7%). A total of 83.2% felt motivated when taking charge of their learning. Time management was commonly perceived as a challenge (76.7% agreed or strongly agreed), 66.4% perceived a need for a facilitator, and 70.0% reported improvement in teamwork skills. Conclusion: Medical undergraduates demonstrated favorable perceptions and attitudes toward SDL, but implementation was constrained by time-management difficulties and a continued need for facilitator support. Structured orientation, protected learning time, gradual scaffolding, and faculty guidance may support effective integration of SDL into the medical curriculum.

Keywords: Education, Medical, Undergraduate; Learning; Self-Directed Learning; Students, Medical; Competency-Based Education; Cross-Sectional Studies

1. Introduction

Competency-based medical education (CBME) has shifted undergraduate medical training toward learner-centered approaches that emphasize demonstrable competencies, reflection, adaptability, and lifelong learning. In India, implementation of the CBME curriculum has increased the formal expectation that medical students assume progressively greater responsibility for identifying and addressing their learning needs. Self-directed learning (SDL) is central to this transition because it positions the learner as an active participant who diagnoses learning needs, formulates goals, identifies resources, selects and implements strategies, and evaluates outcomes, while the teacher functions primarily as a facilitator.[1,2,3]

The relevance of SDL extends beyond acquisition of factual knowledge. Medical education involves substantial academic demands, emotionally complex clinical encounters, repeated role transitions, and continuous exposure to evolving scientific evidence. These conditions require students to develop self-monitoring, reflective reasoning, communication, resilience, and the capacity to update knowledge throughout professional life. Structured SDL may contribute to these competencies by clarifying tasks and learning outcomes, allowing flexible pacing, encouraging use

of diverse resources, and incorporating feedback and assessment. However, poorly supported SDL can increase uncertainty, cognitive load, and stress, particularly among students who have previously learned in predominantly teacher-directed environments.[4,5]

Previous studies have generally reported favorable student perceptions of SDL, but readiness and effectiveness have varied by stage of training, prior educational experience, institutional culture, faculty support, and the degree of curricular integration. Students often value autonomy, deeper exploration, and opportunities for self-assessment, while simultaneously reporting difficulties with time management, prioritization, identifying reliable resources, and approaching complex topics without guidance. Qualitative studies have also suggested that students may conflate SDL with unsupervised self-study, highlighting the importance of explicit orientation and clearly defined facilitator roles.[1,3,6-9]

Evidence from nursing and medical education has linked structured SDL activities with improved engagement, comprehension, independent thinking, teamwork, and confidence. Nonetheless, implementation remains context dependent, and locally generated evidence is required to guide the balance between learner autonomy and faculty scaffolding within CBME. Data from Indian undergraduate students are particularly relevant because SDL has been formally incorporated into a curriculum that is still undergoing institutional adaptation.[10-14]

The present study was therefore undertaken to assess awareness and perceptions of SDL among undergraduate medical students, evaluate their attitudes toward taking responsibility for learning, and identify the challenges and perceived benefits encountered during SDL implementation. The study aimed to generate practical evidence for curriculum planners and faculty members seeking to implement SDL in a structured, supportive, and educationally meaningful manner.

2. Methods

2.1 Study design

A cross-sectional analytical study was conducted using a questionnaire-based survey. The study incorporated quantitative assessment of Likert-scale responses and qualitative thematic analysis of responses to an open-ended question.

2.2 Study setting and duration

The study was conducted over six months, from June to November 2025, among MBBS students from a medical college in India. The survey link was circulated through student WhatsApp groups, and responses were received from participants from several Indian states. The name of the primary study institution and the complete list of participating institutions were not reported in the thesis.

2.3 Study population

The source population comprised undergraduate MBBS students who had been exposed to or were aware of an SDL session. A total of 153 responses were received, of which 137 met the stated eligibility requirements and were included in the analysis.

2.4 Eligibility criteria

2.4.1 Inclusion criteria

Students were included when they were MBBS undergraduates, had attended or were aware of the SDL session, provided consent, and submitted the questionnaire. Additional age, academic-year, institutional, or geographic restrictions were not reported in the thesis.

2.4.2 Exclusion criteria

Responses were excluded when students did not provide consent or reported that they were not aware of the SDL session. Four responses were excluded for lack of consent and 12 for lack of awareness of the SDL session.

2.4.3 Sample size and sampling technique

The final analyzed sample comprised 137 students. A formal sample-size calculation, anticipated prevalence or effect size, confidence level, precision, allowance for non-response, and sampling-frame size were not reported in the thesis. The questionnaire was distributed through WhatsApp groups; therefore, the available information was consistent with non-probability convenience or voluntary-response sampling, although the sampling technique was not explicitly named in the thesis.

2.4 Participant recruitment and enrolment

The questionnaire was created in Google Forms and shared through student WhatsApp groups. The first section included participant consent. Participation was voluntary, students were informed that they could decline participation, and anonymity and confidentiality were maintained. Responses were screened for consent and awareness of the SDL session before inclusion in the analytical dataset. The number of students who received or viewed the invitation, response rate, reminders, and measures used to prevent duplicate submissions were not reported in the thesis.

2.5 Study instrument and data collection

Data was collected using a pre-structured and validated questionnaire. The instrument contained three sections: consent and an open-ended question; sociodemographic information, including age, gender, year of MBBS, and state; and student perceptions of SDL, including usefulness and benefits. The closed-ended component comprised 27 items: 11 items assessing perceptions of SDL, 10 items assessing attitudes toward SDL, and six items assessing barriers, challenges, or benefits associated with implementation. Responses were recorded on a five-point Likert scale: strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). The source or development process of the questionnaire, content-validation method, pilot testing, language, internal-consistency coefficients, construct validity, and scoring thresholds were not reported in the thesis.

In the open-ended component, participants were invited to describe their understanding or opinions regarding SDL. All responses were documented. Two authors independently reviewed the qualitative responses and performed thematic analysis; disagreements were resolved through discussion and consensus. The thesis did not report the coding framework, software, reflexivity procedures, saturation assessment, frequency of themes, or representative quotations.

2.5.1 Study variables

Exposure and independent variables

Recorded descriptive variables included age, gender, academic year, and state of residence or study. The questionnaire also measured individual perception, attitude, challenge, and benefit items. No single primary exposure variable was specified in the thesis.

2.5.2 Outcome variables

The outcomes were the distribution of responses across the five Likert categories for each SDL perception, attitude, challenge, and benefit item, together with themes derived from the open-ended responses. No composite SDL score, readiness score, binary outcome, or prespecified primary endpoint was reported.

2.5.3 Confounding variables

Potential confounders and an adjustment strategy were not reported in the thesis. No multivariable analysis was undertaken.

2.5.4 Operational definitions

Self-directed learning was treated as a learner-centered process in which students take primary responsibility for planning, implementing, monitoring, and evaluating learning, with teachers serving as facilitators. “Positive response” in this manuscript refers descriptively to the combined proportion selecting “agree” or “strongly agree”; this combination was calculated directly from the item-level frequencies reported in the thesis and was not presented as a validated threshold or composite score. Other operational definitions were not reported in the thesis.

2.5.5 Data quality assurance

The thesis stated that a validated questionnaire was used and that anonymity and confidentiality were maintained. Qualitative responses were independently reviewed by two authors, with consensus achieved through discussion. Procedures for training data collectors, checking completeness, range validation, duplicate-response detection, data entry verification, handling inconsistent responses, or auditing the Google Forms export were not reported.

2.5.6 Statistical analysis

Quantitative data were analyzed using Microsoft Excel. Continuous data were summarized using the mean and standard deviation where reported, and categorical or ordinal questionnaire responses were summarized as frequencies and percentages. The thesis did not report tests of normality, confidence intervals, hypothesis tests, effect estimates, subgroup comparisons, correlation analyses, regression modelling, or adjustment for multiple testing. Accordingly, the present manuscript reports descriptive findings without inferential p-values. A conventional

significance threshold was not applicable because inferential statistical testing was not reported. The approach to missing item-level data was not reported; the totals presented in the thesis generally summed to 137, suggesting complete responses for the displayed items, but this was not explicitly stated.

2.5.7 Ethical considerations

Ethical clearance was obtained from the Institutional Ethics Committee before data collection. The committee's name, approval number, and date were not reported in the thesis. Participation was voluntary, written informed consent was obtained, and consent included permission to publish anonymized data. Participant confidentiality and anonymity were maintained.

3. Results

3.1 Participant flow and final sample

A total of 153 questionnaire responses were received. Four students who did not provide consent and 12 students who were unaware of the SDL session were excluded. The final analysis therefore included 137 participants (89.5% of received) (Figure 1).

3.2 Demographic and academic characteristics

The mean age of participants was 19 ± 0.8 years. The thesis reported that 36.6% were aged 18–20 years and 59.3% were aged 21–28 years; the remaining age distribution was not reported, and the stated age categories did not account for the full sample. The male-to-female ratio was 0.7:1. Third-year Part I students formed the largest academic-year group (40%), followed by second-year students, although the exact proportion for the latter and the complete year-wise distribution were not reported. Approximately 65% of participants were from Maharashtra. Exact gender counts, state-wise counts, and full academic-year counts were not provided in the text or tables available in the thesis (Table 1).

3.3 Perceptions of self-directed learning

Students reported generally favorable perceptions of their capacity to direct and evaluate learning. Positive responses were observed for knowing what needed to be learned (73.7%), evaluating learning outcomes (78.1%), monitoring progress (77.4%), connecting new knowledge with personal experience (75.9%), and proactively establishing learning goals (80.3%). Similarly, 75.9% reported being able to identify learning resources and 76.7% understood the strengths and weaknesses of their learning. Written communication received the highest positive response among the communication-related items (78.1%), whereas oral presentation skills were endorsed by 72.3%. The lowest positive proportion in the perception domain concerned managing and controlling learning (61.4%), for which 25.5% were neutral and 13.1% disagreed or strongly disagreed (Table 2 and Figure 2).

3.4 Attitudes toward self-directed learning

Attitudes toward SDL were also favorable. A total of 83.2% agreed or strongly agreed that they felt motivated when they took charge of their learning. Positive responses were reported for becoming self-dependent and thinking in different ways (79.6%), continuing to learn despite difficulties (77.4%), and using interaction with others to plan further learning (75.9%). Successes and failures were perceived as motivating by 85.4% of participants, the highest positive proportion in the attitude domain. Most students also enjoyed finding answers independently (76.7%), set priorities for learning (80.3%), and valued the opportunity to research a topic and express learning creatively (78.9%) (Table 3).

3.5 Challenges and perceived benefits

Time management emerged as the principal reported challenge: 40.9% strongly agreed and 35.8% agreed that it was difficult during SDL, corresponding to a combined positive proportion of 76.7%. The thesis further reported that 66.4% felt a need for facilitator support. Despite these challenges, students perceived several benefits. A combined 70.0% strongly agreed or agreed that SDL improved teamwork skills. The narrative results also indicated that students valued learning at their own pace, exploring innovative learning approaches, comparing their performance with peers for self-improvement, and broader implementation of SDL across medical institutions. Exact response distributions for all six challenge and benefit items were not presented on the available tables and therefore could not be fully tabulated (Table 4).

3.6 Qualitative findings

The open-ended responses indicated that some students confused SDL with self-study. The qualitative narrative otherwise supported themes of learner autonomy, motivation, independent inquiry, peer interaction, and the importance of facilitator guidance. The number of responses contributing to each theme and verbatim quotations

were not reported in the thesis.

Table 1. Baseline demographic and academic characteristics of participants (n = 137)

Characteristic	Finding
Age, years	19 ± 0.8
Age 18–20 years	36.6%
Age 21–28 years	59.3%
Male-to-female ratio	0.7:1
Third-year Part I	40%
Participants from Maharashtra	65%

Data are presented as mean ± standard deviation, percentage, or ratio. The two reported age-category percentages do not sum to 100%; no explanation was provided in the thesis.

Table 2. Selected perception responses regarding self-directed learning (n = 137)

Item	Strongly agree, n (%)	Agree, n (%)	Positive response, n (%)
Know what I need to learn	41 (29.9)	60 (43.8)	101 (73.7)
Evaluate own learning outcomes	52 (38.0)	55 (40.1)	107 (78.1)
Monitor learning progress	49 (35.8)	57 (41.6)	106 (77.4)
Connect new knowledge with experience	55 (40.1)	49 (35.8)	104 (75.9)
Proactively establish learning goals	49 (35.8)	61 (44.5)	110 (80.3)
Follow own learning plan	50 (36.5)	43 (31.4)	93 (67.9)
Find learning resources	53 (38.7)	51 (37.2)	104 (75.9)
Communicate effectively in oral presentations	46 (33.6)	53 (38.7)	99 (72.3)
Understand learning strengths and weaknesses	56 (40.9)	49 (35.8)	105 (76.7)
Manage and control learning	42 (30.7)	42 (30.7)	84 (61.4)
Communicate effectively in writing	55 (40.1)	52 (38.0)	107 (78.1)

Positive response was calculated as strongly agree plus agree. Percentages may differ slightly because of rounding. SDL, self-directed learning.

Table 3. Attitudes toward self-directed learning (n = 137)

Item	Strongly agree, n (%)	Agree, n (%)	Positive response, n (%)
Motivated when taking charge of learning	57 (41.6)	57 (41.6)	114 (83.2)
SDL promotes self-dependence and different thinking	50 (36.5)	59 (43.1)	109 (79.6)
Continue learning despite difficulties	49 (35.8)	57 (41.6)	106 (77.4)
Interaction with others helps plan learning	55 (40.1)	49 (35.8)	104 (75.9)
Successes and failures inspire continued learning	66 (48.2)	51 (37.2)	117 (85.4)
Continue to like learning regardless of outcome	55 (40.1)	52 (38.0)	107 (78.1)
Enjoy finding answers	56 (40.9)	49 (35.8)	105 (76.7)
Set learning priorities	49 (35.8)	61 (44.5)	110 (80.3)
Learn language/culture of frequent contacts	53 (38.7)	57 (41.6)	110 (80.3)
Research topics independently and express learning creatively	52 (38.0)	56 (40.9)	108 (78.9)

Positive response was calculated as strongly agree plus agree. SDL, self-directed learning.

Table 4. Principal challenges and perceived benefits of self-directed learning

Domain	Reported finding
Time management challenge	40.9% strongly agreed and 35.8% agreed; combined 76.7%.
Need for facilitator	66.4% felt facilitator support was needed.
Improved teamwork skills	37.2% strongly agreed and 32.8% agreed; combined 70.0%.
Other perceived benefits	Learning at own pace, innovative learning approaches, self-assessment against peers, improved communication, and wider curricular implementation.

Only numerical findings explicitly reported in the thesis are shown. The full response distribution for the six challenge/benefit items was not available.

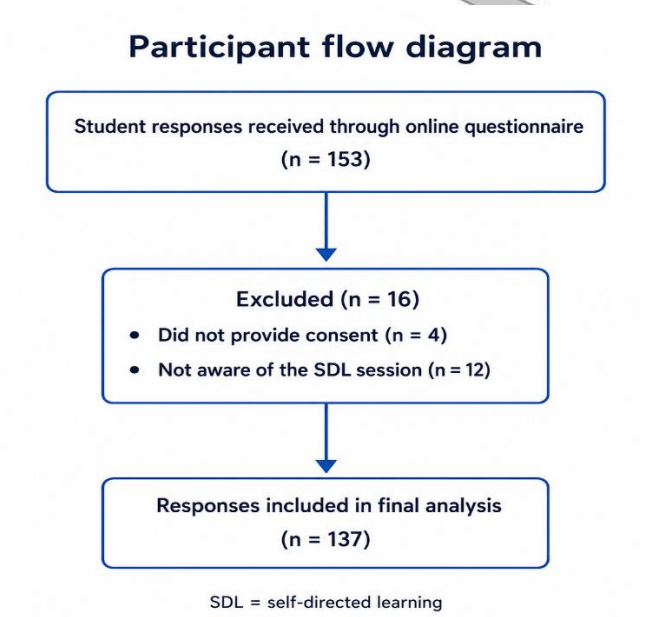

Figure 1. Participants flow through the cross-sectional survey.

Legend: Of 153 responses received, 16 were excluded and 137 were included in the final descriptive analysis. SDL, self-directed learning.

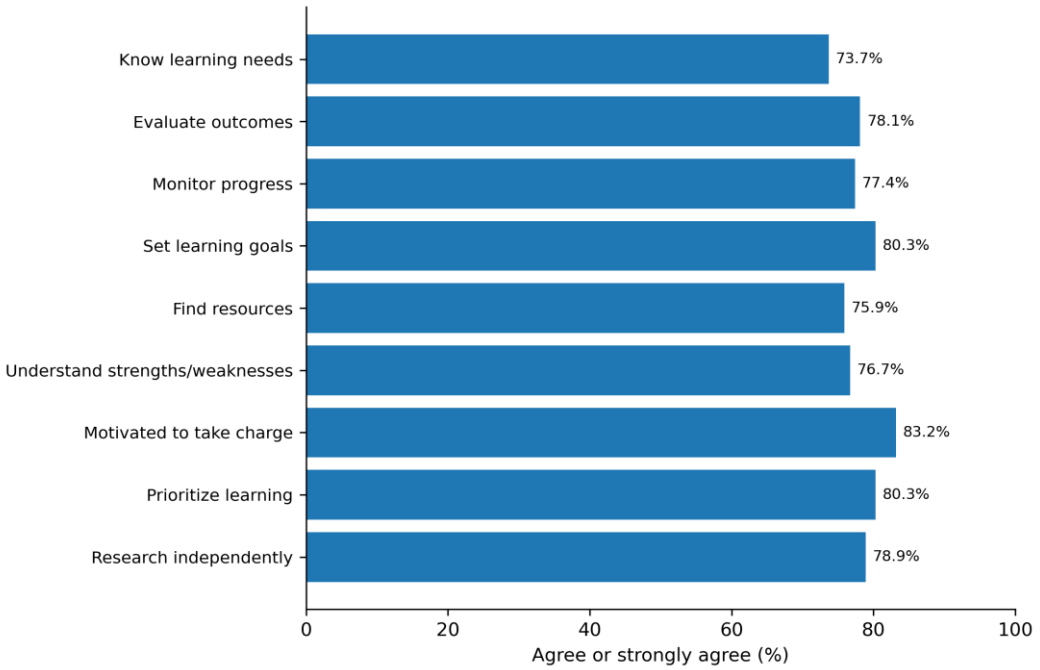

Figure 2. Positive responses to selected perception and attitude items.

Legend: Bars show the proportion of participants who selected “agree” or “strongly agree” for selected questionnaire items. Percentages were calculated from the frequencies reported in the thesis. The figure is descriptive and does not represent a validated composite SDL score. SDL, self-directed learning.

4. Discussion

This cross-sectional survey found that undergraduate medical students generally held favorable perceptions and attitudes toward SDL. More than three-quarters of participants endorsed most items relating to goal setting, progress monitoring, outcome evaluation, resource identification, recognition of learning strengths and weaknesses, and independent inquiry. Motivation was particularly strong: 83.2% reported feeling motivated when taking charge of learning, while 85.4% indicated that successes and failures inspired continued learning. These findings suggest substantial acceptance of learner responsibility among the surveyed students. At the same time, the lower positive response for managing and controlling learning, together with the high frequency of reported time-management difficulty and the perceived need for facilitator support, indicated that willingness to engage in SDL did not necessarily translate into complete practical readiness for unsupported independent learning.

The favorable perceptions observed in this study were consistent with earlier reports from medical education settings. Bhandari et al. found that students generally recognized their capacity for SDL while still identifying areas that required support, and Angadi et al. reported positive perceptions when SDL, alignment, and integration were introduced within a competency-based curriculum.[2,3] Qualitative work by Bansod et al. similarly emphasized that students valued SDL when its purpose, process, and expected outcomes were clearly explained.[1]

The high endorsement of goal setting, monitoring, and outcome evaluation was educationally important because these processes distinguish SDL from unstructured self-study. Linkous described SDL as a broader competency in which learners assume responsibility for learning decisions while drawing on an external facilitating environment.[6] The qualitative observation that some participants confused SDL with self-study therefore identified a meaningful implementation gap. Without orientation, students may interpret SDL as simply being asked to study alone, rather than as a deliberate cycle of identifying needs, selecting resources, applying strategies, receiving feedback, and evaluating performance.

Participants also reported strong motivation, persistence, enjoyment of finding answers, and willingness to prioritize learning. These findings were compatible with studies suggesting that structured SDL can increase engagement, confidence, independent thinking, and cognitive participation.[7,11,12] Roberts et al. reported that readiness for SDL developed longitudinally during medical training, indicating that autonomy may strengthen as students gain experience and become more familiar with expectations.[9] The predominance of third-year Part I students in the present sample may partly explain the favorable attitudes, although the absence of year-wise comparative analysis prevented assessment of this possibility.

Peer interaction and teamwork were also prominent. Three-quarters of participants indicated that interactions with others helped them plan further learning, and 70.0% perceived improvement in teamwork skills. These findings support collaborative models of SDL in which autonomy is not equated with isolation. Wong et al. identified multiple learner and educational factors associated with SDL readiness, while Kemp et al. described collaborative SDL as a model that can build confidence and peer interaction.[10,13] In medical education, such collaboration may be particularly relevant because clinical reasoning and patient care require communication, shared decision-making, and the ability to learn from colleagues.

Time management was the most clearly quantified barrier, with 76.7% agreeing or strongly agreeing that it was challenging. Similar barriers have been reported in the literature, including limited time, difficulty planning learning activities, uncertainty about resource selection, and competing curricular demands.[5,15] Within a dense undergraduate curriculum, SDL may be perceived as an additional task unless protected time, achievable outcomes, and realistic assessment requirements are built into the timetable. The relatively low endorsement of the ability to manage and control learning provided convergent evidence that scheduling and self-regulation were areas requiring support.

The reported need for a facilitator among 66.4% of participants reinforced the importance of guided progression. Premkumar et al. emphasized that readiness for SDL is influenced by context and support, while Iwasa described the teacher's role in facilitating rather than replacing learner responsibility.[5,16] Siraj et al. also documented difficulties encountered by students during planning and implementation of SDL.[17] Faculty involvement should therefore focus on scaffolding: clarifying objectives, helping learners formulate questions, suggesting credible resources when necessary, monitoring progress, and providing timely feedback. Excessive direction could undermine autonomy, but complete withdrawal of guidance may disadvantage students who have not yet developed planning and appraisal skills.

The findings have practical implications for CBME implementation. SDL could be introduced progressively, beginning

with structured, faculty-guided sessions in earlier phases and advancing toward greater learner independence. Orientation should explicitly differentiate SDL from ordinary self-study. Protected time, reflection logs, self-assessment rubrics, peer discussion, and feedback may help students translate positive attitudes into effective behavior. Faculty-development activities should prepare teachers to function as facilitators and to provide consistent scaffolding. A recent systematic review and meta-analysis comparing SDL with traditional didactic learning further supports continued evaluation of how SDL is designed and integrated rather than treating it as a uniform intervention.[14]

- **Strengths**
  The study assessed multiple dimensions of SDL using a 27-item questionnaire and included both closed-ended and open-ended responses. The item-level frequency distributions provided a detailed descriptive account of perceptions and attitudes. Independent review of qualitative responses by two authors with consensus discussion added a basic measure of analytical rigor. The inclusion of students from several states broadened the geographic reach beyond a single local cohort, although participation remained concentrated in Maharashtra.

- **Limitations**
  The principal limitations were the modest sample size, voluntary online recruitment, concentration of respondents in a few states, and the absence of a reported sampling frame or response rate; these features limited generalizability and introduced the possibility of selection bias. The study was descriptive and did not compare SDL perceptions across age, gender, academic year, or state. No inferential analysis, confidence intervals, validated composite score, or multivariable adjustment was reported. Important instrument properties, including validation procedures and reliability coefficients, were not provided. The complete data for the six challenge and benefit items were unavailable. Self-reported responses were susceptible to social-desirability and recall biases. Finally, cross-sectional data could not determine whether favorable perceptions translated into improved academic performance, clinical competence, or sustained lifelong-learning behavior.

- **Recommendations for future research**
  Future studies should use multicenter probability-based or clearly defined consecutive sampling, report response rates, and include adequately powered comparisons across phases of training and institutional contexts. The questionnaire should undergo transparent psychometric evaluation, and composite domain scores should be prespecified where appropriate. Longitudinal or controlled educational studies should examine whether structured SDL interventions improve knowledge retention, clinical reasoning, academic outcomes, wellbeing, and professional development. Qualitative work should include explicit coding procedures and representative quotations to clarify how students understand autonomy, facilitator support, and workload.

5. Conclusion

Undergraduate medical students in this survey demonstrated favorable perceptions and attitudes toward self-directed learning. Most participants reported confidence in identifying learning needs, establishing goals, locating resources, monitoring progress, evaluating outcomes, and pursuing topics independently. Motivation and persistence were particularly prominent, and students perceived benefits for teamwork, communication, self-assessment, and creative inquiry. However, the findings also showed that positive attitudes did not eliminate implementation difficulties. Time management was a major challenge, the ability to manage and control learning received comparatively lower endorsement, and many students continued to value facilitator support. These findings supported a structured rather than completely unguided approach to SDL within competency-based medical education. Progressive scaffolding, explicit orientation, protected curricular time, peer learning, and consistent faculty feedback may help students develop practical self-regulation while preserving learner autonomy. Because the study used a descriptive, voluntary online sample with limited geographic representation, the findings should be interpreted cautiously and confirmed through larger multicenter and longitudinal research.

6. References

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