Section: Pediatrics

Original Research Article

READINESS FOR SELF-DIRECTED LEARNING AND LEARNING STYLE PREFERENCES AMONG MEDICAL UNDERGRADUATES: A CROSS-SECTIONAL STUDY

Nikitha Raj S N[1]

[1]Assistant Professor, Department of Pediatrics, MVJMC & RH, Bengaluru, India.

Received : 15/01/2026
Received in revised form : 04/03/2026
Accepted : 22/03/2026

Keywords:
Self-directed learning, Learning styles, medical students, Lifelong learning.

Corresponding Author:
Dr. Nikitha Raj S N,
Email: snnikitharaj@gmail.com

DOI: 10.47009/jamp.2026.8.2.202

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2026; 8 (2); 1101-1107

ABSTRACT

Background: Self-directed learning (SDL) is a core competency in competency-based medical education, essential for fostering lifelong learning among medical students. Understanding students' readiness for SDL and their learning style preferences can help optimize teaching strategies. **Objectives:** To assess self-directed learning readiness among Phase III MBBS students and to determine their preferred learning styles using the VARK model, along with evaluating the correlation between them. **Materials and Methods:** A cross-sectional questionnaire-based study was conducted among 298 Phase III MBBS students at a tertiary care teaching institution. Data were collected using the 29-item abridged Self-Directed Learning Readiness Scale (SDLRS) and the VARK Learning Styles Questionnaire. Descriptive statistics and non-parametric tests were used for analysis, and Spearman's correlation assessed relationships between SDL readiness and learning styles. **Results:** The mean SDL readiness score was 102.42 ± 19.70, indicating moderate readiness. Over half of the participants (53.5%) demonstrated high readiness, while 42.9% had average readiness. Self-control scored highest, whereas self-management and desire for learning were comparatively lower. Visual learning was the most preferred style (37.2%), followed by kinaesthetic and read/write modalities. Aural and read/write learning styles showed significant positive correlations with SDL readiness ($p < 0.05$), whereas visual and kinaesthetic styles did not. SDL readiness improved with academic progression. **Conclusion:** SDL readiness among medical undergraduates is moderate, with gaps in self-management and motivation. Learning style variability influences SDL engagement, highlighting the need for structured, learner-centred approaches and tailored teaching strategies to enhance lifelong learning skills.

INTRODUCTION

Medicine evolves rapidly, with today's breakthroughs quickly becoming tomorrow's basics, necessitating continuous learning among medical professionals. This is reflected in the competency-based medical education framework of the National Medical Commission, which emphasizes lifelong learning as a core outcome.[1] In this context, self-directed learning (SDL) signifies a transition from traditional teacher-centered approaches to a more learner-centered model and is recommended to be routinely incorporated in undergraduate training to foster and strengthen lifelong learning skills. SDL is defined by Knowles as a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources, implementing appropriate learning strategies, and evaluating learning outcomes.[2] It is also described as a process in which learners take the initiative, with the support and collaboration of others by Collins and Hammond.[3] SDL can be applied at all levels of medical education, but its greatest impact lies at the undergraduate stage, where early inculcation of these skills supports continuous professional development throughout a medical career.

In today's dynamic medical landscape, the ability to learn independently is essential rather than optional. SDL fosters critical thinking, decision-making, and deeper understanding, enabling effective application of knowledge in clinical settings. However, learners are not inherently prepared for SDL and require development of readiness for the same. It also helps address key challenges in medical education, including vast curricula, varied learning styles, limited faculty, and the need for constant knowledge updating, while supporting flexible and self-paced learning. Additionally, evolving trends such as online

ISSN (O): 2687-5365; ISSN (P): 2753-6556

education, globalization, and recent pandemic experiences further highlight the importance of SDL, making the assessment of self-directed learning readiness among MBBS students crucial for its effective implementation.[4]

To enable such growth, assessing SDL readiness is therefore critical for designing effective educational strategies. Fisher et al. introduced the 52-item Self-Directed Learning Readiness Scale (SDLRS), which measures readiness across self-control, self-management, and desire for learning.[5] To improve response rates and efficiency, a reliable abridged version of Fisher's SDLRS with 29 items, developed and proposed by Akkilagunta et al., is an effective alternative.[6] Students' readiness for SDL hinges on various factors, such as the facilitator's influence, the teaching-learning process, the learning environment, the teacher-student relationship, and their personal commitment to learning. Utilizing appropriate pedagogical tools is crucial for motivating students and fostering self-directed learning, ultimately shaping adaptable medical practitioners.[7]

Learning styles, in conjunction with the assessment of readiness, significantly influence effective learning. These styles reflect how learners acquire and process information through visual, auditory, reflective and experiential methods and adapt over time and in different contexts. Several models assess learning preferences, including Kolb's Learning Styles Inventory, Honey and Mumford's theory,[8] and the VARK model.[9,10] Among these, VARK—Visual, Auditory, Read/Write and Kinesthetic—remains concise, practical and widely applicable in medical education.

Learners may exhibit unimodal, bimodal, trimodal or quadrimodal preferences, which allow for tailored instructional strategies. Fleming,[9] developed the VARK model categorizing learners by sensory modalities. Visual learners thrive when immersed in diagrams, charts and illustrative handouts. Auditory learners excel when they actively participate in lectures, podcasts and clinical case discussions, benefiting most from verbal explanations and spoken instructions. Read/write learners achieve mastery through patient record analysis, intensive reading of texts and diligent note-taking. Kinesthetic learners truly flourish with hands-on experiences, including dissections, clinical skills workshops and direct clinical examinations. Each modality demands targeted engagement to unlock the learner's full potential. In the context of modern medical education, recognizing diverse learning preferences enhances self-directed learning, critical thinking and academic performance. Integrating VARK-informed strategies supports the growing need for flexible, learner-centered methodologies in the CBME curriculum.

Consequently, with SDL as a core competency in the CBME framework, it becomes imperative to assess students' SDL readiness scores. If educators are aware of the different learning styles, they can identify and solve the learning problems amongst students. This enables effective capacity building and faculty training to guide students in achieving this competency. Accordingly, this study aims to evaluate medical students' SDL readiness using the abridged 29- item SDLRS and identify their preferred learning styles via the VARK questionnaire, contributing to more effective, learner-centered medical education strategies.

Aims and Objectives

1. To evaluate the preparedness of MBBS Phase III students for self-directed learning
2. To determine preferred learning styles through the application of the VARK questionnaire.
3. To assess the correlation between Self-directed Learning Readiness scores and VARK learning style modality scores.

MATERIALS AND METHODS

An observational cross-sectional questionnaire-based study was conducted at MVJ Medical College and Research Hospital in Bengaluru. It involved MBBS Phase III students from the 2021 and 2022 batches who voluntarily participated after providing informed consent. Institutional Ethics Committee approval was obtained before the study began.

Data collection was conducted online through Google Forms using two structured questionnaires to ensure convenience and prompt responses. Participants were first briefed on the objectives and structure of the Self-Directed Learning Readiness Scale (SDLRS) and the VARK Learning Styles Questionnaire. Detailed instructions and a specific timeframe for completing the surveys were provided. Sociodemographic information such as age, gender, area of residence, and place of study was also collected. Completion of the surveys marked the end of the data collection process.

The 29-item abridged Self-Directed Learning Readiness Scale (SDLRS) was used to assess self-directed learning readiness across three domains: Self-Control (14 items, maximum score 70), Self-Management (9 items, maximum score 45), and Desire for Learning (6 items, maximum score 30). Each item was rated on a 5-point Likert scale (1-5), providing a structured way to evaluate learners' readiness. The total score ranges from 29 to 145.[6] Students were then grouped into three categories: below average (score <73), average (score 74-109), and above average (score >110).

Following an assessment of self-directed learning readiness, the study employed the VARK Learning Styles Questionnaire to delve into individual learning preferences. This 16-item tool explored four modalities—Visual, Aural, Read & Write, and Kinesthetic—using relatable everyday scenarios like finding a specific shop or improving photography skills.[10] This ensured participant engagement. Each question presented four options, each corresponding to a specific learning style, allowing participants to select multiple options that best represented their

ISSN (O): 2687-5365; ISSN (P): 2753-6556

preferences. Scores for each modality ranged from 0 to 16, and students with equal scores in two or more modalities were classified as having a multimodal learning preference. By sequentially incorporating both tools, the study not only gauged readiness for self-directed learning but also identified the dominant styles through which students preferred to interact with educational content.

Data were entered into Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics, including frequencies and percentages, summarized participant characteristics. Non-parametric tests like the Mann–Whitney U and Kruskal–Wallis tests were used to compare Fisher's scores across subgroups. Similarly, associations between participant characteristics and VARK scores were examined. Finally, Spearman's rank correlation was performed to assess the relationship between VARK and Fisher scores.

RESULTS

The study involved 298 students, comprising 66.4% females and 33.6% males. A majority (74.8%) were from urban areas, while 25.2% were from rural regions. Most students (64.8%) were day scholars, with the remaining 35.2% living in hostels. The academic year representation was nearly even, with 49.7% enrolled in Phase III Part I and 50.3% in Phase III Part II. Overall, the 298-student cohort was evenly distributed across academic years, though there was a noticeable skew towards female and urban participants, which aligns with typical enrolment patterns.

Among 298 participants, the mean SDLR score was 102.42 ± 19.70, reflecting moderate readiness with a reasonably precise estimate, as shown in Table 1. Self-control had the highest mean of 50.74 ± 10.92, with a narrow confidence interval and lower interquartile range, indicating stable autonomous learning behaviors. Self-management scored 28.97 ± 7.59, with moderate variability in its CI and IQR, suggesting scope for targeted improvement. Desire for learning was the lowest at 22.70 ± 4.89, with relatively wider variability, highlighting the need to enhance intrinsic motivation. The findings suggest that implementing structured curricular interventions aimed at enhancing self-management and fostering a lasting desire for learning could significantly improve overall readiness for self-directed and lifelong learning.

According to the SDLRS scores, 53.52% of students exhibited high readiness, 42.88% were in the average category, and 3.60% showed low readiness. Most students demonstrated readiness or near-readiness for self-directed learning, supporting a dual approach of independent and problem-based learning for the majority, with targeted interventions for the small low-readiness group.

An analysis of learning styles indicated that visual learning was the most prevalent (37.2%), followed by kinesthetic (21.8%) and read/write (17.1%) modalities. Aural learners represented only 8.1% of the sample, while 15.8% of participants were classified as multimodal learners. This distribution suggests that the majority of students are likely to benefit from visually oriented instructional methods, with a significant subset deriving advantage from hands-on or experiential learning. The comparatively low proportion of aural learners implies that purely lecture-based teaching may not be effective for most of the cohort. Incorporating visual aids, practical demonstrations, and multimodal strategies is therefore recommended to optimize learning outcomes.

SDLR scores depicted in Table 2 showed minimal variation across gender and residence, indicating little demographic influence on self-directed learning readiness. Urban settings were associated with significantly higher student self-management ($p < 0.05$), while other SDLR measures remained unchanged. Phase III Part II students demonstrated higher mean scores compared to Phase III Part I across all domains and in overall SDLRS. These differences were statistically significant ($p < 0.05$), supporting the trend of improved readiness with academic advancement. Building on these demographic findings, aural and multimodal learners have the highest mean scores in self-control and overall readiness, with p-values indicating statistical significance. Visual and read/write learners display intermediate scores without notable advantages in any single domain, whereas kinesthetic learners consistently record the lowest mean scores across domains, particularly in overall SDLR. Table 2 integrates the quantitative findings with statistical significance, complementing the visual narratives from Figures 1 & 2 and providing a concise overview of the factors influencing self-directed learning readiness.

In line with this, Figure 1 shows box-plots of SDLRS scores comparing Phase III Part I and II students across Self-Control, Self-Management, Desire for Learning, and Overall Readiness. Phase III Part I students have lower medians with moderate variability and some low outliers. Phase 3 Part II students show higher medians, especially in Self-Control and Overall Readiness, with a broader IQR and a few high outliers. Overall, SDLRS improves with academic progression, reinforcing the study's quantitative findings. Similarly, Figure 2 compares SDLRS scores across learning styles, highlighting self-control and overall readiness. Aural learners have the highest median scores, with a narrow IQR and few outliers, indicating consistently high readiness. Multimodal learners follow closely, showing slightly lower medians, moderate variability, and some high-performing outliers. Visual and Read/Write learners exhibit intermediate performance, with wider IQRs and a mix of high and low outliers, reflecting greater variability. Kinesthetic learners record the lowest medians, with a tight IQR and only a few upper outliers, suggesting

ISSN (O): 2687-5365; ISSN (P): 2753-6556

consistently lower readiness. Overall, the clear separation of medians shows that learning style significantly affects SDLR, with aural and multimodal learners outperforming kinesthetic learners, highlighting the need for focused approaches for the latter.

Analysis of the association between sociodemographic characteristics and VARK scores, as illustrated in Table 3, revealed that gender, area of residence, and place of stay did not significantly influence Visual, Aural, Read/Write, or Kinesthetic learning preferences ($P > 0.05$). However, a significant difference was observed with respect to the year of study. Phase III Part II students demonstrated significantly higher scores in Aural learning (Mann–Whitney U = 8141.0, P = 0.000) and Read/Write learning (Mann–Whitney U = 9684.0, P = 0.000) compared to Phase III Part I students, suggesting a shift in preference towards these learning styles in later academic phases. No significant differences were observed for Visual and Kinesthetic learning across any sociodemographic variables.

Spearman correlation analysis (Table 4) showed that Aural learning scores were significantly correlated with self-control (r = 0.220), self-management (r = 0.179), desire for learning (r = 0.194), and overall SDL readiness (r = 0.236). Read/Write scores demonstrated slightly weaker but positive correlations with the same domains (r = 0.141–0.199; all $P \leq 0.05$). Visual and Kinesthetic learning styles showed no significant associations with SDL (all $P > 0.05$), indicating the need for customized approaches to enhance self-directed learning in these groups.

Table 1: Self-directed learning readiness among study participants

DOMAIN	MEAN ± SD	MEDIAN (IQR)	RANGE
SELF CONTROL DOMAIN SCORE	50.74 ± 10.92	53 (44-49)	14-70
SELF MANAGEMENT DOMAIN SCORE	28.97 ± 7.59	30 (23-34)	Sep-45
DESIRE FOR LEARNING DOMAIN SCORE	22.70 ± 4.89	23 (19-26)	30-Jun
SELF DIRECTED LEARNING READINESS SCORE	102.42 ± 19.70	106 (89-116)	29-145

Table 2: Association of sociodemograhic characteristics with SDLR scores in different domains and overall self-directed learning readiness

		SELF CONTROL DOMAIN SCORE		SELF MANAGEMENT DOMAIN SCORE		DESIRE FOR LEARNING DOMAIN SCORE		SELF DIRECTED LEARNING READINESS SCORE	
		MEDIAN (IQR)	MANN WHITNEY U (P VALUE)	MEDIAN (IQR)	MANN WHITNEY U (P VALUE)	MEDIAN (IQR)	MANN WHITNEY U (P VALUE)	MEDIAN (IQR)	MANN WHITNEY U (P VALUE)
Gender	Male	52.5 (42-58.5)	9813.5 (p=0.902)	29 (22.5-35)	9421.5 (p=0.495	23 (18.5-25.5)	8894.5 (p=0.151)	106 (87-116)	9493.0 (p=0.562)
	Female	53 (44-59)		30 (23-34)		24 (20-27)		106 (93-117)	
Area of residence	Urban	53 (43-59)	8003.0 (p=0.577)	29 (23-33)	6778.0 (p=0.014)*	23 (19-27)	8088.0 (p=0.670)	106 (89-116)	8041.0 (p=0.618)
	Rural	52 (45-57)		32 (24-36)		23 (19-25)		106 (93-116)	
Place of stay	Hostel	52 (45-57)	9445.0 (p=0.333)	30 (25-34)	9873.0 (p=0.715)	23 (19-27)	9777.5 (p=0.616)	105 (89-113)	9705.2 (p=0.547)
	Day Scholar	54 (44-59)		30 (23-34)		24 (20-26)		107 (89-117)	
Year of Study	Phase III Part I	51 (42-58)	9324.0 (p=0.017)*	27.5 (22-33.5)	9058.5 (p=0.006)	22.5 (18-26)	9443.0 (p=0.026)	102(86.5-113.5)	8954.0 (p=0.004)
	Phase III Part II	54 (45-59)		31 (25-36)		24 (21-27)		107 (96-118)	
Type of learner	Visual	53 (46-59)	Kruskal Wallis H = 13.664, p=0.008*	29 (23-34)	Kruskal Wallis H = 9.100, p= 0.059	23 (19-27)	Kruskal Wallis H = 8.906, p=0.063	105 (94-116)	Kruskal Wallis H = 12.492, p=0.014
	Aural	55.5 (50.5-63.5)		32 (29.5-37)		24 (21.5-26)		113.5 (104-123)	

ISSN (O): 2687-5365; ISSN (P): 2753-6556

	Read/ write	52 (42-58)		31 (25-36)		23 (18-26)		106 (87-116)	
	Kinae sthetic	48 (36-57)		27 (22-32)		21 (18-25)		102 (78-112)	
	Multi modal	55 (47-59)		30 (22-34)		25 (21-28)		109(94-119)	

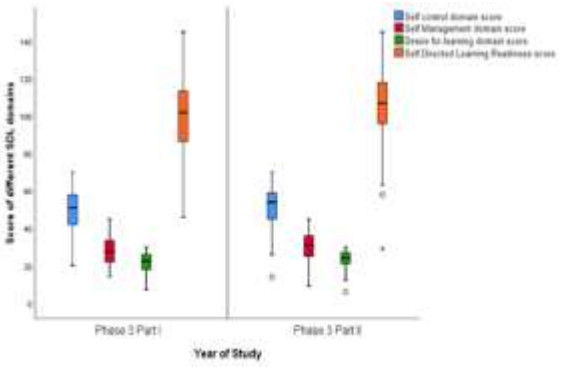

Figure 1: Comparison of Self-Directed Learning Preparedness in Phase Iii Part I & Ii Students

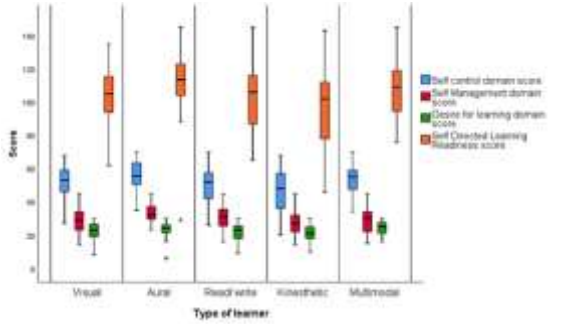

Figure 2: Comparison of Self-Directed Learning Preparedness in Different Types of Learners

Table 3: Association Between Sociodemographic Characteristics and Vark Scores

		TOTAL SCORE (VISUAL)		TOTAL SCORE (AURAL)		TOTAL SCORE (READ/WRITE)		TOTAL SCORE (KINESTHETIC)	
		MEDIAN (IQR)	MANN WHITNEY U (P VALUE)	MEDIAN (IQR)	MANN WHITNEY U (P VALUE)	MEDIAN (IQR)	MANN WHITNEY U (P VALUE)	MEDIAN (IQR)	MANN WHITNEY U (P VALUE)
Gender	Male	7(4.5-11)	9699.0 (p=0.774)	5(3-8)	9255.5 (p=0.357)	5(2-8)	9558.0 (p=0.625)	7(5-8)	9652.5 (p=0.723)
	Female	7(5-10)		6(3-8)		5(2-8)		7(5-8)	
Area of residence	Urban	7(5-11)	8298.0 (p=0.920)	6(3-8)	7748.5 (p=0.339)	5(2-8)	7728.0 (p=0.324)	7(5-8)	7571.0 (p=0.217)
	Rural	7(5-11)		5(2-8)		6(3-8)		7(4-8)	
Place of stay	Hostel	7(5-11)	9074.0 (p=0.135)	5(2-8)	9101.0 (p=0.145)	6(2-8)	8892.5 (p=0.08)	7(5-9)	9987.5 (p=0.837)
	Day Scholar	7(5-10)		6(3-8)		5(2-7)		7(5-8)	
Year of Study	Phase III Part I	6.5(4-11)	9682.5 (p=0.056)	4.5(2-8)	8141.0 (p=0.000)	4(1-6.5)	9684.0 (p=0.000)	7(5-8)	10741.5 (p=0.627)
	Phase III Part II	8(5-10)		6(4-8)		6(4-8)		7(5-9)	

Table 4: Spearman Correlation of Scores on the Vark Scale with Scores on the Sdlr Fischer Scale

VARK Score Type	Self-Control Domain Score	Self-Management Domain Score	Desire for Learning Domain Score	Self-Directed Learning Readiness Score
Total score (Visual)	r = 0.074 p = 0.205	r = 0.033 p = 0.569	r = 0.055 p = 0.342	r = 0.065 p = 0.262
Total score (Aural)	r = 0.220** p = 0.000	r = 0.179** p = 0.002	r = 0.194** p = 0.001	r = 0.236** p = 0.000
Total score (Read/Write)	r = 0.146* p = 0.011	r = 0.141* p = 0.015	r = 0.199** p = 0.001	r = 0.178** p = 0.002
Total score (Kinesthetic)	r = -0.038 p = 0.515	r = -0.034 p = 0.563	r = 0.015 p = 0.790	r = -0.018 p = 0.759

DISCUSSION

To enhance readiness and foster lifelong learning skills among future medical professionals. The present study assessed self-directed learning (SDL) readiness among MBBS students and found that overall readiness remains suboptimal, with only a limited proportion achieving optimum levels and none demonstrating higher levels of readiness. These findings are comparable to the studies of Abdelsalam AE et al,[11] and B. Sharmistha et al,[12] who reported moderate SDL readiness among undergraduate medical students, particularly in the early phases of training. Khan et al,[13] and Palve and Palve,[14] have

ISSN (O): 2687-5365; ISSN (P): 2753-6556

highlighted variability in SDL readiness and emphasized the need for structured academic support to enhance these competencies.

In terms of domain-wise SDL readiness, the present study demonstrated relatively better performance in the self-control domain, whereas self-management and desire for learning were comparatively lower. This suggests that although students may possess motivation and a sense of responsibility toward learning, they often lack essential skills related to planning, organization, and sustained engagement. Comparable domain-wise disparities have been reported by Shenoy et al,[15] who observed that students demonstrate readiness in certain domains but remain deficient in execution-related components. Kiran and Hema,[16] similarly noted that while students recognize the importance of SDL, practical barriers such as lack of guidance and academic burden limit its effective implementation.

The suboptimal SDL readiness observed in the present study may be attributed to multiple factors, including the persistence of teacher-centered learning, extensive curriculum demands, and limited structured exposure to SDL strategies. Previous studies have emphasized that learners are often not explicitly trained in key SDL skills such as goal setting, resource identification, and self-evaluation. Evidence from Roberts et al,[17] further suggests that SDL readiness improves progressively with increased exposure and academic advancement, indicating that these skills are developmental in nature and can be strengthened through structured curricular integration.

With regard to learning style preferences, the present study demonstrated a predominance of visual and kinesthetic learners, which is consistent with findings by Mishra et al,[18] A systematic review by Shakeri et al,[19] supports the presence of heterogeneous learning styles among medical students, highlighting that no single instructional strategy is universally effective. Additionally, comparative studies such as that by Nagesh RG et al,[20] suggest that learning preferences may evolve across different phases of medical training, potentially influencing engagement with SDL.

The variability in learning styles observed in the present study may partly explain differences in SDL readiness, as students with different sensory preferences may engage differently with self-directed learning strategies. Overall, the findings of the present study are consistent with existing literature and underscore that SDL readiness among MBBS students requires further strengthening. These results highlight the need for early and structured integration of SDL into the curriculum through mentorship, guided learning activities, and continuous feedback, along with alignment of teaching strategies to diverse learning preferences to effectively foster lifelong learning skills among medical students.

CONCLUSION

The present study demonstrates that self-directed learning readiness among MBBS students is suboptimal, with notable deficiencies in self-management and motivation despite relatively better self-control. Learning style variability further influences engagement with SDL. These findings highlight the need for early, structured integration of SDL strategies within the medical curriculum, along with mentorship and learner-centered approaches.

REFERENCES

1. Medical Council of India (MCI). Competency Based Undergraduate Curriculum for the Indian Medical Graduate. Vol. 1. MCI; Medical Council of India (MCI); 2018. p. 20. Available from: https://www.nmc.org.in/wp-content/uploads/2020/01/UG-Curriculum-Vol-I.pdf.
2. Murad MH, Varkey P. Self-directed learning in health professions education. Ann Acad Med Singap. 2008; 37:580-90.
3. Collins R, Hammond M. Self-directed learning to educate medical educators, Part 2: Why do we use self-directed learning? Med Teach 1987; 9:425-32.
4. Badyal DK, Lata H, Sharma M, Jain A. Triple Cs of self-directed learning: Concept, conduct, and curriculum placement. CHRISMED J Health Res 0; 0:0.
5. Fisher, M., King, J., & Tague, G. (2001). Development of a self-directed learning readiness scale for nursing education. Nurse Education Today, 21(7), 516–522.
6. Akkilagunta S, Kar SS, Premarajan KC et al. Assessment of reliability and adaptation of fisher's 52-item self-directed learning readiness scale among medical students in Southern India. Int J Adv Med Health Res. 2019; 6:7-11.
7. Shenoy PJ, Rukmini MS, Rashmi KS. Readiness for self-directed learning among medical undergraduate students: Opportunities and challenges. J Krishna Inst Med Sci Univ. 2025; 14(1):150-155.
8. Yusuf Polat, Ali Aykut PEKER, Rabia Ozpeynirci et al. The effect of learning styles of accounting education students on their performance: a field study. Procedia - Social and Behavioral Sciences. 2015; 174:1841–8.
9. Fleming ND, Mills C. Not another inventory, rather a catalyst for reflection. To Improve the Academy. 1992;11(1):137–155.
10. VARK Learn Limited. The VARK questionnaire [Internet]. Christchurch (NZ): VARK Learn Limited; [cited 2026 Feb 27]. Available from: https://vark-learn.com/the-vark-questionnaire/
11. Abdelsalam AE, Eltwansy ME. Readiness for self-directed learning and learning style preferences among first year's medical students. Int J Community Med Public Health. 2023 Jan 25;10(2):575-80.
12. Sharmistha B, Anjan A. Self-directed learning readiness among first-year MBBS students in a Government Medical College of Kolkata, India: A cross-sectional observational study. Natl J Physiol Pharm Pharmacol. 2025;15(1):33-40.
13. Khan MR, Shazia A, Rawool VA, et al. Self-directed learning readiness among MBBS students using the 29-item abridged self-directed learning readiness scale: Association with artificial intelligence and library usage. J Nat Sci Med 0; 0:0.
14. Palve SS, Palve SB. Assessing self-directed learning readiness among Indian medical graduates: Implications for educators and policymakers. J Educ Health Promot. 2025 Nov 28; 14:499. doi: 10.4103/jehp.jehp_1864_24. PMID: 41574017; PMCID: PMC12822878.
15. Shenoy PJ, Rukmini MS, Rashmi KS. Readiness for self-directed learning among medical undergraduate students: Opportunities and challenges. J Krishna Inst Med Sci Univ. 2025; 14(1):150-155.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

16. Kiran M, Hema NG. Perspectives of medical undergraduate students toward self-directed learning. Indian J Physiol Pharmacol. 2024; 68:176-80. doi: 10.25259/IJPP_30_2023
17. Roberts M, Darden A et al. A longitudinal assessment of self-directed learning readiness and development in medical students. J Med Educ Curric Dev. 2024;11.
18. Mishra S, Guria J, V P, Mishra A. Assessment of learning style preferences among medical students and their correlation with academic performance in first-year MBBS subjects. J Med Law Public Health. 2025;5(4):791-800. doi:10.52609/jmlph.v5i4.215
19. Shakeri F, Ghazanfarpour M, MalaKoti N et al. Learning styles of medical students: a systematic review. Med Edu Bull. 2022;3(2):441-56. doi: 10.22034/MEB.2022.328652.1050.
20. G NR, M MS, B D, Patil S. A comparative study of the learning styles among 1st, 2nd and final year MBBS students. Int J Basic Clin Pharmacol. 2016;5(6):2341-4.

ISSN (O): 2687-5365; ISSN (P): 2753-6556