



SELF-DIRECTED LEARNING READINESS IN UNDERGRADUATE MEDICAL STUDENTS – A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Self-Directed Learning (SDL) is a way of learning. A learner takes responsibility for his/her learning by formulating learning goals and identifying resources to achieve the same.

Objectives: The current study was conducted to know the level of SDL readiness in undergraduate medical students in a tertiary teaching hospital and to see the correlation between SDLRS score and demographic parameters across different years of study so that appropriate recommendations may be provided for teaching delivery.

Methods: SDLRS Likert scale questionnaire was administered to 302 medical undergraduates across the first to the ninth semester in paper form during August-October 2018. It consists of 40 questions categorized under three domains, namely Self-management (9 items), Desire for learning (13 items), Self-Control (18 items).

Results: The present study included 302 participants. The average SDL score is 149.847 % of the students included in the current study have scores <150. The current study shows that there is no significant association between Gender ($P=0.30$), Current Age ($P=0.07$), age at admission into the medical course ($P=0.75$), and level of SDL readiness. Students who had English and Hindi as a medium of instruction before admission to medical school have better SDL scores than those whose medium of instruction was in either one of the languages ($P=0.005$). In addition, students from the third semester have significantly higher SDL scores than students from other semesters ($P=0.04$).

Conclusions: Since the SDL scores are low in these students, they require more teacher-led discussions, demonstrations, and lectures in the initial period rather than independent projects, case studies, and private tutorials.

KEYWORDS : Medical Education; Self Directed Learning; Self-Directed Learning Readiness; Self-Directed Learning Readiness Score; Undergraduate Medical Education.

INTRODUCTION

Self-Directed Learning (SDL) is a method of learning in adult education. The learner takes responsibility for his/her learning by identifying learning needs, formulating learning goals, identifying resources for learning, and evaluating outcomes.^[1] It is claimed to enhance individual capacity to work in a dynamic educational and work environment. Self-directed learning is essential in medical education and training, which is rapidly evolving due to expanding knowledge and increasing access to information where graduates must develop a habit of lifelong learning.^[2] In medical education, traditional teaching includes didactic lectures given by a single lecturer to a group of students. In self-directed learning, the student takes the initiative in learning. SDL readiness exists as a continuum and present in all students with teacher-directed (pedagogical learning) and self-directed or andragogic learning at either pole.^[3]

Grow, in his staged SDL model, describes the learner to be in any of the four stages- dependent (Stage 1), interested (Stage 2), involved (stage3), and self-directed (stage4). Teachers need to diagnose the learner's stage of self-direction and prepare the learner to advance to higher stages.^[4]

Several studies are done on self-directed readiness in medical institutions in India, recruiting undergraduate medical students with variable results.^[5-9]

The current study was conducted to know the level of SDL

readiness in undergraduate medical students in a tertiary teaching hospital with an aim to provide appropriate recommendations for teaching delivery.^[8-11]

MATERIAL AND METHODS

A cross-sectional study was conducted during August-October 2018 after due approval from the Institutional Ethics Committee. All the medical Undergraduates enrolled during the study period from the first to the ninth semester were invited to participate in the study. Out of the total students enrolled in the Institute, 302 students participated in the study. Oral consent was taken from all the participants. A self-directed learning readiness scale (SDLRS) was used to collect data. The questionnaire has been modified and validated by a team of experts for use in medical students. It consists of 40 questions categorized under three domains, namely Self-management (9 items), Desire for learning (13 items), Self-Control (18 items) (Table 1).

(Table 1) SDLRS questionnaire

Table 1. SDLRS questionnaire		
Domain		Question
Self-management	Item 1	I solve problems using a plan
	Item 2	I prioritize my work
	Item 3	I do not manage my time well
	Item 4	I have good management skills
	Item 5	I set strict time frames

	Item 6	I prefer to plan my learning
	Item 7	I am systemic in my learning
	Item 8	I am confident in my ability to search out information
	Item 9	I prefer to set my own learning goals
Desire for learning	Item 1	I am able to focus on a problem
	Item 2	I need to know why
	Item 3	I critically evaluate new ideas
	Item 4	I learn from my mistakes
	Item 5	I am open to new ideas
	Item 6	When presented with a new problem I cannot resolve ,I will ask for assistance
	Item 7	I am responsible
	Item 8	I like to evaluate what i do
	Item 9	I do not enjoy studying
	Item 10	I have a need to learn
	Item 11	I enjoy a challenge
	Item 12	I want to learn new information
	Item 13	I enjoy learning new information
Self-control	Item 1	I have high personal expectation
	Item 2	I have high personal standards
	Item 3	I have high beliefs in my abilities
	Item 4	I am aware of my own limitations
	Item 5	I set specific times for my study
	Item 6	I am self-disciplined
	Item 7	I like to gather the facts before I make a decision
	Item 8	I am disorganized
	Item 9	I am logical
	Item 10	I am methodical
	Item 11	I evaluate my performance
	Item 12	I prefer to set my own criteria on which to evaluate my performance
	Item 13	I am responsible for my own decisions /actions
	Item 14	I can be trusted to pursue my own learning
	Item 15	I can find out information for my self
	Item 16	I like to make decisions for my self
	Item 17	I prefer to study my own goals
	Item 18	I am not in control of my life

It is a Likert-type instrument for assessing readiness for SDL described by Fisher et al. in 2001 for evaluation of SDL readiness in nursing students.^[11] A similar instrument has been used in several other studies conducted on medical students also.^[5]

The SDLRS scores range from 40 – 200. The scores obtained by an individual indicate the currents level of readiness for SDL. Items that are negatively phrased are reverse scored.

The validity of the instrument has been studied extensively. It has a test-retest reliability of 0.829 and 0.79 (1.25 and 26). A Pearson split-half reliability estimate of 0.94 and a Cronbach's coefficient alpha which is an estimate of internal consistency and reliability is 0.924 for total items in this study tool.^[11]

The instrument contains two distinct sections. The first section includes the demographic details of the participant, i.e., current age, age at admission to the course, gender, medium of instruction before enrolment to the medical course. The second section contains the SDLRS questionnaire. SDLRS

questionnaire was administered in paper form to all the students participating in the study by the investigators. Students who were absent at the time of data collection were given two more opportunities to participate in the study on the subsequent days.

STATISTICAL ANALYSIS:

Data Analysis was done using Microsoft Excel. A p-value of 0.05 was taken as significant in this study. Mann Whitney test was done to find the association between demographic variables like semester, gender, age at admission, medium of instruction. A Chi-square test was used to find the association between SDLRS score and the current age of the student.

RESULTS

Out of 450 students enrolled in the course, 419 students were available during the study. 302 students out of 419 participants completed the questionnaire with a response rate of 72.07%. The majority of students enrolled in the study were males (68.87%) and between 20 and 25 years of age. Students from all semesters were recruited in the present study. For most students (85.10%), the medium of instruction was English before enrolment in the medical college (Table 2).

(Table 2) Basic demographic parameters of Study participants

Table 2: Basic demographic parameters of Study participants			
Serial No	Demographic parameter	Number	Percentage
1.	Semester wise number of Students		
	First	34	11.25%
	Third	46	15.23%
	Fourth	53	17.54%
	Fifth	52	17.21%
	Seventh	53	17.54%
	Ninth	64	21.19%
2.	Gender of Students		
	Male	208	68.87%
	Female	94	31.12%
3.	Current Age of Students		
	15-20	89	29.47%
	20-25	208	68.87%
	25-30	5	16.55%
4.	Age at Admission		
	15-20	274	90.72%
	20-25	28	9.27%
5.	Medium of Instruction before enrolling in medical college.		
	Hindi	37	12.25%
	English	257	85.10%
	Hindi and English combined	6	1.99%
	Regional language	2	0.66%

The present study included 302 participants. The average SDL score is 149.8 (Table 3).

(Table 3) Overall Average SDLRS scores in each of domains.

Table 3. Overall Average SDLRS scores in each of domains.				
	Average of Self-Management Max Score = 45	Average of Desire for Learning .Max score = 65	Average of Self Control. Max score = 90	Total
Overall Average	31.68	49.89	68.21	149.78

47 % of the students included in the current study have scores

<150. The present study shows that there is no significant association between Gender ($P=0.30$), Current Age ($P=0.07$), age at admission into the medical course ($P=0.75$), and level of SDL readiness. Out of all the demographic parameters assessed, only semester and medium of Instruction have shown significant relation to SDL scores. Students who had

English and Hindi (the native language of India) as a medium of instruction before admission to medical school had better SDL scores than those whose medium of instruction was in either one of the languages ($P=0.005$). Students from the third semester have significantly higher SDL scores than students from other semesters ($P=0.04$) (Table 4).

(Table 4) Association between SDLRS score and demographic parameters.

Table 4. Association between SDLRS score and demographic parameters.								
Serial No	Demographic parameter	Number	Percentage	SDL Scores		Max .SDL score	Min .SDL Score	Test p value
				<150 no. (%)	>150 no. (%)			
	Total	302	100%	142(47%)	160(53%)	188	104	
1.	Semester wise number of students							
	First	34	11.25%	16(47%)	18(53%)	179	116	Mann Whitney test. P=0.04
	Third	46	15.23%	15(33%)	31(67%)	188	104	
	Fourth	53	17.54%	23(43%)	30(57%)	178	114	
	Fifth	52	17.21%	23(44%)	29(56%)	178	114	
	Seventh	53	17.54%	32(60%)	21(40%)	184	110	
	Ninth	64	21.19%	33(52%)	31(48%)	181	112	
2.	Gender of Students							
	Male	208	68.87%	94(45%)	114(55%)	188	110	Mann Whitney Test. P=0.30
	Female	94	31.12%	48(51%)	46(41%)	184	104	
3.	Current Age of Students							
	15-20	89	29.47%	33(37%)	56(63%)	188	104	Chi square test. P=0.0
	20-25	208	68.87%	107(51%)	101(49%)	184	110	
	25-30	5	16.55%	2(40%)	3(60%)	167	113	
4.	Age at Admission							
	15-20	274	90.72%	129(47%)	145(53%)	188	104	Mann Whitney test .P=0.75
	20-25	28	9.27%	13(46%)	15(54%)	179	112	
5.	Medium of Instruction							
	Hindi	37	12.25%	22(59%)	15(41%)	184	113	Mann Whitney Test. P=0.005
	English	257	85.10%	120(47%)	137(53%)	188	104	
	Hindi and English	6	1.99%	0(0%)	6(100%)	163	157	
	Regional	2	0.66%	0(0%)	2(100%)	173	160	

DISCUSSION

Self-directed learning has gained prominence in medical education as traditional pedagogical teaching cannot help students become competent in current medical practice, which is dynamic. Reforms to the medical curriculum have been attempted recently to introduce self-directed learning.^[12]

Assessment of the level of SDL readiness in medical students is necessary to assess the teaching needs of the students and make the required reforms to the curriculum and method of teaching delivery.

All students have some amount of SDL readiness. However, an absolute scale to measure SDL readiness in students is not described. In our current study, assessment of SDL readiness is done by SDLRS scale, which was evaluated and has good evidence of construct validity.

According to Fisher et al., a mean score of >150 on the SDLRS is considered an acceptable SDL readiness level. In our current study done we have observed that a significant percentage (about 47%) of students involved have scores <150.^[13] (Table 4).

SDL readiness is more dependent on an individual's aptitude and attitude for learning.^[14] In our study, there is no significant correlation between the age of students and SDL readiness. In India, most students getting admitted into medical institutions are between 17-20 years, and the minimum age for admittance into the medical institution is 17 years. In our present study, 90.7% of the students are between 17-20 years old at the time of admission. None of the students have any prior higher education or work experience, unlike in western medical institutions where an undergraduate degree in the field of sciences is required for entry into medical school.

SDLR scores are shown to increase with age and higher levels of previous education in some studies.^[15]

In our study, we did not find any significant relationship between SDLR scores and Age ($P=0.07$) and Age at admission ($P=0.75$) (table 4). Furthermore, a similar study in another medical institution in India showed no significant relationship between age and SDLR score.^[5]

There was no significant correlation between gender and SDLR scores in our study. Overall there are more male students than female. Other studies that were done both in India and other parts of the world showed variable results. A study conducted by Kar et al. in south India showed better scores with boys than girls.^[5,6,17]

SDLRS scores were low for students in higher study years of medical training compared to scores of students at admission. Thus, an increase in the number of years of training in medical school is not associated with higher SDL scores. A similar study done on dental students has shown the same results.^[17]

This might be attributed to culture leading to a shift from deep learning to superficial learning in higher study years. The change in paradigm from active information seeking to learn for completion of course also is one of the contributing factors as noticed from the opinions of students in one study.^[5]

The medical curriculum also plays a role in the level of SDL readiness.^[5] Owing to the low scores in students of higher study years compared to students at admission, changes should be made to the curriculum regarding course content and method of delivery. Innovative approaches to teaching should be implemented to increase SDL readiness in students. Students should be taught inquisitive learning

rather than exquisite learning. Some of the methods that the teachers can use for SDL are planning independent projects for learners, asking students to write a critical reflection on their understanding of a concept or topic, create further learning plans based on the critical reflection, carry out student-directed discussions where the teacher acts as a monitor and problem-solving.^[4]

SDLRS scores were significantly high for students whose medium of instruction before admission was in Hindi and English languages.

Whether receiving instruction in more than one language in the schooling period increases the ability for autonomous learning or not could not be deduced from the current study as these students account for only 1.99 % of the total number of students.

Predominantly self-directed learning leads to frustration and anxiety in students and hostility towards the teacher. Predominantly teacher-directed learning does not improve the student's ability to learn in novel situations and be self-reliant. A balance between teacher-directed and self-directed learning should be achieved for proper training of medical undergraduates. Both the teacher and learner should have the knowledge and skills to implement self-directed learning successfully. Teacher preparation is also necessary to implement SDL.^[14,18]

The goal of medical education should not be merely a transfer of knowledge but learning how to acquire knowledge and skill for which the student should be aware of his/her needs and take the initiative for learning. Therefore, teaching delivery should be matched with SDL readiness.^[14,19,20]

The role of teachers is to assess the level of readiness in students and adjust teaching methods to suit the student's needs. Teachers need to outline objectives for achieving a skill level. The ongoing curriculum should be integrated with clinical practice. Wherever possible, learning should be integrated with clinical problems, and the teacher should help the student identify resources to learn to solve the problem. The teachers should help students formulate a plan to reach the learning goals and critically appraise their performance in implementing the objectives. Identifying students' strengths and weaknesses and formulating the teaching plan according to it would help in better learning. Mentoring of students by faculty would improve the learning environment.^[21] Students with low scores need didactic lectures initially until they become self-directed and develop personal autonomy in learning and formulating goals. The educator should evaluate the self-directed learner in four dimensions: personal autonomy, self-management in learning, learner control in instruction, the independent pursuit of learning, and adjust teaching delivery according to needs.^[22]

Inquiry-based learning and problem-based learning methodologies help in increasing self-directedness in students. Introductory courses regarding SDL before the commencement of medical training facilitate self-directed learning in students. Reforms to the current teaching methodology in the Institute are required to make the students actively learn rather than study to clear the course. Changes to the current curriculum are to be made, which has more SDL opportunities by introducing problem-based and inquiry-based learning by early clinical exposure. Whether students will benefit from SDL sessions alone or in conjunction with traditional lectures is an area to be studied. A study done on first-year medical students comparing two groups, one group received an SDL session with conventional lecture and another group only traditional lecture on a topic in physiology

did not show a significant difference in test scores between two groups.^[9]

In another study done in the second year medical undergraduates in microbiology, participants agreed that SDL helped better understand the topic and stimulated active learning.^[23]

SDL may not be beneficial in all medical subjects. In one study, it was found that SDL is not an appropriate way of learning anatomy. The benefit of SDL differs between subjects.^[24-25]

Limitations of the study

In the present study, only students from a single medical institution were included.

Data consists of only self-reports given by students enrolled in the study. The responses are entirely dependent on student perceptions. SDLR scores should also be measured after the internship program because students will be exposed to real-life scenarios in the internship and stimulate problem-based learning, which improves SDL readiness. More extensive studies with more participants recruited from different medical institutions are needed to draw better conclusions that will help make reforms in medical education and training. Further research is required to validate and make reforms to the SDLRS scale. SDLRS scores should be matched with academic performance for a better deduction of inference. SDL sessions for different medical subjects are to be conducted and correlated with students' performance by tests.

CONCLUSION

Since the SDL scores are low in these students, they require more teacher-led discussions, demonstrations, and lectures in the initial period rather than independent projects, case studies, and private tutorials. Furthermore, cultivating a habit of self-directed learning helps students acquire skills and knowledge required for facing real-life medical situations. Therefore, the goal of teacher-directed education should be to increase SDL readiness in students.

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