

Exploring first-year undergraduate medical students' self-directed learning readiness to physiology

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²Sydney Nursing School, The University of Sydney, Sydney, New South Wales, Australia; and ³Department of Community Medicine, Kasturba Medical College, and ⁴Melaka Manipal Medical College, Manipal Campus, Manipal University, Karnataka, India

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Abraham RR, Fisher M, Kamath A, Izzati TA, Nabila S, Atikah NN. Exploring first-year undergraduate medical students' self-directed learning readiness to physiology. *Adv Physiol Educ* 35: 393–395, 2011; doi:10.1152/advan.00011.2011.—Medical students are expected to possess self-directed learning skills to pursue lifelong learning. Previous studies have reported that the readiness for self-directed learning depends on personal attributes as well as the curriculum followed in institutions. Melaka Manipal Medical College of Manipal University (Karnataka, India) offers a Bachelor of Medicine and Bachelor of Surgery (MBBS) twinning program that is of 5 yr in duration. Keeping in mind the amount of time that the curriculum has devoted for self-directed learning, we explored the self-directed learning readiness of first-year MBBS students ($n = 130$) using a self-directed learning readiness scale (SDLRS) and explored the correlation between SDLRS scores of high achievers, medium achievers, and low achievers with their academic performance in physiology examinations. Students were requested to respond to each item of the SDLRS on a Likert scale. Median scores of the three scales of the SDLRS were compared across the three groups of students using a Kruskal-Wallis test. SDLRS scores of the students ($n = 130$) were correlated with their marks in theory papers of first, second, and third block-end examinations using Spearman's correlation coefficient. The mean item score for desire for learning was found to be higher followed by self-control and self-management. Data analyses showed significantly high ($P < 0.03$) median scores for self-control for high achievers compared with medium and low achievers. Between the groups, high achievers had a higher score for all the three scales of the SDLRS followed by low and medium achievers. SDLRS scores and academic performance of the three groups of students were found to exhibit a weak correlation. This study threw light on the fact that despite having a high desire for learning and ability of self-control, students need to be supported in their self-management skills.

academic performance; self-management; self-control; desire for learning

MEDICAL STUDENTS are expected to possess self-directed learning (SDL) skills to pursue lifelong learning. SDL is widely being used in medical as well as other healthcare professional course settings (7). In the Indian context, avenues for SDL at the undergraduate level are minimal. Candy (1) reported SDL as the process of deciding what to learn to what depth and breadth. SDL readiness is defined as the degree the individual possess attitudes, abilities, and personality characteristics necessary for self-directed learning (11). Guglielmino's (5) SDL

readiness scale (SDLRS) has been the most extensively used instrument in determining SDL readiness. Fisher et al. (3) reported the development of a SDLRS to measure SDL readiness in nursing students, which could also be used in medical and allied health courses. The readiness for SDL depends on personal attributes as well as the curriculum followed in institutions (4). Some researchers have emphasized the importance of context in motivating students to become self-directed (4).

Melaka Manipal Medical College (MMMC) of Manipal University (Karnataka, India) offers a Bachelor of Medicine and Bachelor of Surgery (MBBS) twinning program that is of 5 yr in duration. The program envisages 2.5 yr of training each at Manipal Campus in India and Melaka Campus in Malaysia. In the first year, students are taught anatomy, physiology, and biochemistry, whereas pathology, microbiology, pharmacology, and forensic medicine are taught in the second year. After this, students pursue 6 mo of clinical training in Manipal, and the remaining part of the course is completed at Melaka. The aim of the present study was to understand to what extent first-year undergraduate medical students are ready for SDL before they proceed through their second year and 6 mo of clinical training at Manipal. This study attempted to explore the SDL readiness of first-year undergraduate medical students in physiology in a hybrid curriculum and also correlated the SDLRS scores of high achievers, medium achievers, and low achievers with their academic performance in physiology examinations. The present study was conducted as a part of Mentored Student Project program at MMC and was granted institutional research committee clearance.

METHODS

The first-year curriculum is divided into four blocks (teaching units), each of 10 wk in duration, as follows:

- *Block I:* basic concepts and nerve and muscle physiology
- *Block II:* cardiovascular, respiratory, and gastrointestinal physiology
- *Block III:* endocrine, reproductive, and renal physiology
- *Block IV:* the central nervous system and special senses

The teaching and learning strategies in the first year include didactic lectures, SDL, problem-based learning (PBL), and laboratory sessions. In a block, four slots of 2 h each are devoted for SDL sessions in physiology. In SDL sessions, the whole batch of students is divided into five groups, with each group led by a subject expert. These groups are again subdivided into four or five subgroups. The topics for SDL are provided at the beginning of the block itself, and these topics will not be discussed in the lecture. Students are required to spend time in studying the given topic themselves either

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Table 1. Scores for items of the SDLRS

Item	Mean	SD
I solve problems using a plan	3.72	0.95
I prioritize my work	3.77	0.97
I do not manage my time well	2.78	1.20
I have good management skills	3.24	1.0
I set strict time frames	2.94	1.15
I prefer to plan my own learning	3.72	1.00
I am systematic in my learning	3.28	1.07
I am confident in my ability to search out information	3.75	0.96
I set specific times for my study	3.53	1.20
I am self-disciplined	3.33	1.07
I am disorganized	3.27	1.26
I am methodical	3.58	0.97
I can be trusted to pursue my own learning	3.78	1.01
<i>Self-management</i>	3.44	0.32
I need to know why	4.10	1.04
I critically evaluate new ideas	3.55	1.00
I learn from my mistakes	4.05	1.02
I am open to new ideas	4.11	0.95
When presented with a problem I cannot resolve, I will ask for assistance	3.89	1.15
I like to evaluate what I do	3.66	0.97
I do not enjoy studying	3.61	1.30
I have a need to learn	4.00	0.92
I enjoy a challenge	3.99	0.95
I want to learn new information	4.07	1.02
I enjoy learning new information	4.06	0.96
I like to gather the facts before I make a decision	3.78	0.94
<i>Desire for learning</i>	3.91	0.20
I am able to focus on a problem	3.47	1.01
I prefer to set my own learning goals	3.94	1.04
I am responsible	3.82	0.99
I have high personal expectations	3.95	1.12
I have high personal standards	3.91	1.09
I have high beliefs in my abilities	3.88	0.99
I am aware of my own limitations	4.04	0.97
I am logical	4.01	0.83
I evaluate my own performance	3.86	0.89
I prefer to set my own criteria on which to evaluate my performance	3.80	0.87
I am responsible for my own decisions/actions	4.12	0.86
I can find out information for myself	3.82	0.97
I like to make decisions for myself	3.92	1.00
I prefer to set my own goals	3.97	1.05
I am not in control of my life	3.61	1.34
<i>Self-control</i>	3.87	0.16

SDLRS, self-directed learning readiness scale.

independently or collaboratively. In the SDL session, students present different topics following 10–15 min of group discussion. It is ensured that all students present at least once in a block. In the PBL sessions (3 slots of 3 h in duration each per block), students are required to spend a substantial amount of time in SDL before they come for the presentation session.

Table 2. Subscales and total scores and measures of the central tendency of SDLRS scores for HA, MA, and LA

	Subscale 1: Self-Management			Subscale 2: Desire for Learning			Subscale 3: Self-Control		
	HA	MA	LA	HA	MA	LA	HA	MA	LA
Mean	46.5	42.47	45.83	50	44.3	48.7	62.8	53.22	59.83
SD	7.21	1.29	5.51	4.85	1.41	5.51	5.75	1.72	6.93
Median	49	46	46	50.5	48	48	61.5	57	59.5
Interquartile range	(41.5, 51.25)	(42, 48)	(41, 50)	(46.2, 54.2)	(44, 53)	(45, 52)	(58.7, 68)	(53, 62)	(56, 64.7)
Total mean score	44.75 (8.92)			48.95 (9.48)			57.84 (11.88)		
Total score	151.54								

HA, high achievers; MA, medium achievers; LA, low achievers.

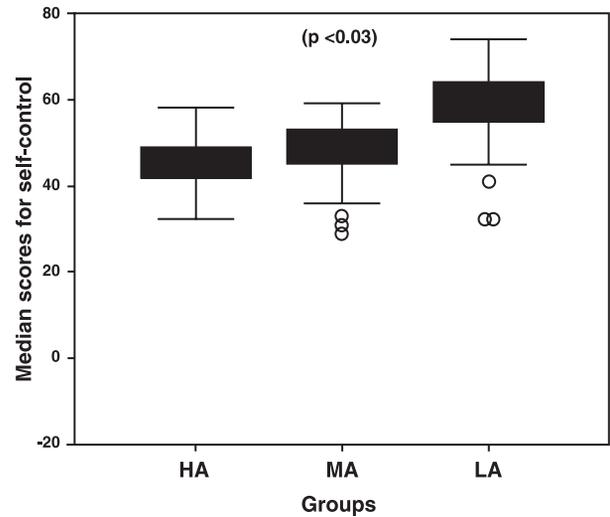


Fig. 1. Boxplot of the median scores for self-control for the three groups of students. HA, high achievers; MA, medium achievers; LA, low achievers.

Keeping in mind the amount of time the curriculum has devoted for SDL, we explored the SDL readiness of first-year MBBS students ($n = 130$) using the SDLRS of Fisher et al. (3). The SDLRS has 40 items grouped under 3 scales: self-management (9 items), desire for learning (16 items), and self-control (15 items). Furthermore, based on the academic performance in the three blocks, the whole batch of students was divided into three categories: high achievers ($>75\%$, $n = 10$), medium achievers (64–74%, $n = 41$), and low achievers ($<64\%$, $n = 79$). Students who consistently fell into these three categories in all three blocks were identified. Students were requested to respond to each item on a Likert scale (where 5 = strongly agree, 4 = agree, 3 = unsure, 2 = disagree, and 1 = strongly disagree). Four items (items 5, 54, 65, and 91) were scored in a reverse manner. Median scores of the three scales were compared across the three groups of students using a Kruskal-Wallis test. SDLRS scores of these students were correlated with their marks in theory papers (includes essay and multiple true/false components) of first, second, and third block end examinations (the fourth block end examination was not over during the conduct of the study) using Spearman's correlation coefficient. For statistical analyses, SPSS (version 15) was used.

RESULTS

The response rate was 90.7% ($n = 118$ students). The total score was found to be 151.4 (of 200), with 60.2% of students having a score of >150 and 39.85% of students with a score of <150 . Mean scores for the items and the three subscales are shown in Table 1. The mean item score for desire for learning was found to be higher followed by self-control and self-

management. Subscale and total scores and measures of central tendency of SDLRS scores for high, medium, and low achievers are shown in Table 2. We observed that for the three groups of students, the scores for self-control were higher followed by desire for learning and self-management. Between the groups, high achievers had a higher score for all the three scales of SDLRS followed by low and medium achievers. Data analyses showed significantly high ($P < 0.03$) median scores for self-control for high achievers compared with medium and low achievers, as shown in Table 1. We observed that the median and interquartile ranges of self-control were higher for high achievers than those observed for medium and low achievers, as shown in Fig. 1. Median scores for desire for learning ($P = 0.06$) and self-control ($P = 0.27$) were not statistically significant. SDLRS scores and academic performance of the three groups of students were found to have a weak correlation.

DISCUSSION

SDL skills constitute an essential learning outcome expected from medical students, particularly from those in a curriculum that encompasses PBL and similar SDL activities. MMMC offers ample opportunities for students for SDL through PBL and SDL components of the curriculum. The total score indicated that students had appreciable SDL skills. It was encouraging to observe a high score for desire for learning (Table 1) for physiology, which is a positive outcome. The teaching, learning, and assessment strategies adopted at MMMC in imparting physiology education to students seem to be successful in creating the desire for learning physiology. Our results are supported by those of an earlier study (9), which also reported a high score for desire for learning followed by self-control and self-management. The present study revealed that even though desire for learning was strong, students had difficulties in managing their strategies (setting specific times and being systematic) in learning physiology. In a medical school with a packed curriculum such as MMMC, in the first year ~85% of the time per day would be devoted for learning anatomy and the remaining would be shared by physiology and biochemistry. Therefore, it is quite natural for the students to have difficulty in managing their time in learning physiology. The total scores for each subscale (Table 2) for the whole batch of students reflected a positive attitude toward readiness for SDL. Among the three scales of the SDLRS, self-control received a higher mean score compared with the other scales for the three groups of students. This shows that the students are capable of setting their own learning goals and making decisions themselves. Previous studies (2, 8, 10) have reported a positive correlation between SDLRS scores and academic performance. However, this study revealed a weak correlation between SDLRS scores and the academic performance of students in physiology examinations, which could have been due to the relatively low mean score for self-management. It

was surprising to observe that the low achievers possessed more SDL skills (higher mean SDLRS scores in all three scales) than medium achievers. Based on these data, it would be wise to plan specific strategies pertaining to the improvement of self-management skills of students so that they can improve their academic performance. The present study threw light on the fact that despite having a high desire for learning and ability of self-control, students need to be supported in their self-management skills. They should be guided in managing their time, resources, and strategies effectively. At MMMC, in the second year of the curriculum, much more time is allotted for SDL activities compared with the first year. Therefore, it is important for us to plan ahead in terms of supporting strategies before students enter the second year, so that they can improve on their SDL skills.

Limitations of the study. The present study was based on a self-report questionnaire that explored student perceptions and therefore is not a direct measure of their SDL readiness. Additionally, the small and unequal sample size among the three groups of students could have contributed to the observed differences.

Conclusions. This study provided baseline data regarding the SDL readiness of first-year undergraduate medical students. This study provides a scope for further exploring modes of supporting students to attain SDL skills.

DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the author(s).

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