Self-directed learning: health care professional's perspective - A study

Munazza Fathima[1], Syeda Noorul Absar[1], Ghulam Subhani[1], Neeraj Sadiq[1*], Mohammed Khaleel[2], Mohammed Mohsin[1] and Maddipati Sai Krishna[3]

[1]Department of Pharmacology, Deccan College of Medical Sciences, P.O. Kanchanbagh, DMRL 'X' Road, Santhosh Nagar, Hyderabad-500058, Telangana, India, [2]Department of Microbiology, Mahavir Institute of Medical Sciences, Shiva Reddy Pet, Vikarabad, Ranga Reddy-501102, Telangana, India and [3]Department of Community Medicine, Deccan College of Medical Sciences, P.O. Kanchanbagh, DMRL 'X' Road, Santhosh Nagar, Hyderabad-500058, Telangana, India

Abstract: *Background:* Self-directed learning is a teaching learning method emphasized as a part of newly developed competency based medical education (CBME) which was implemented in 2019 and since then it is an active part of the curriculum. *Aims and Objectives:* To evaluate the shift in learning process from teacher based education to a student based instruction by assessment of Self-Directed Learning Readiness (SDLR) scores among health professional's medical students, nursing students, Physiotherapy and Pharmacy students. *Material and Methods:* A questionnaire based prospective observational study was done in Deccan College of Medical Sciences from Aug 2022 to October 2022. Statistical analysis was done using R language. *Results:* Maximum SDLR score obtained was 105 and minimum was 21. Scores <80 were considered low and > 80 as high. SDLR scores of most students were low. The scores were comparable to other studies like a South Indian study done who reported a mean SDLRS score in the low readiness category and some studies scores were high readiness to learn. *Conclusion:* Most students are ready for self- directed learning but their scores need to improve.
Keywords: Self-Directed Learning, Student Based, Self- Directed Learning Scores.

Introduction

Learning can be instructor based (pedagogical) or it can be self-directed (androgogy) which is described by Malcom Knowles as a process [1] in which individuals take the lead, with or without the help of instructor in establishing teaching goals, locate and access resources, adopt and execute activities monitor and evaluate performance, reassess learning strategies and implement them. The androgogical learner, in contrast, desires to be in charge of addressing his or her analytical demands [2]. The best way to describe self-directed learners is as capable natural analysts [3].

Numerous novel ideas, including foundation courses, self-directed learning (SDL), early clinical experience, etc., have been supported by India's implementation of a competency-based medical education curriculum. Active teaching-learning techniques are being emphasized [4]. In view of the prototype replacements in the new curriculum, it is essential to appreciate the fundamental notion and the methods for worthwhile use of SDL in the new curriculum [5]. The PBL (problem based learning) method and SDL education must be used in adult nursing instruction with a more defined learning process in order to maximize learning outcomes [6].

In order for self-directed persistent trainer to function beneficially, the students must know how to gain understanding and be skillful to grasp [7]. It's fascinating to think about the research done by Guglielmino, 2011, who examined the SDL ranking in 17 divergent nationalities and found a considerable practical connection linking SDL and originality, amplitude, and productive growth

[8]. Since 2019, competency-based medical education (CBME) has integrated self-directed learning, and this willingness to learn can be estimated by measuring and identifying SDLRS (self-directed learning readiness scores).

In this study we undertake the readiness the students are to learn after change to competency based curriculum from 2019 in various health professionals and also to compare SDLR scale among students of different years of study and to correlate the SDLR scores of various demographic factors.

Material and Methods

Study design: A questionnaire based prospective observational study online Google form involving medical students of three batches of 2020 (2nd year), 2019(3rd year), 2018(4th year), students of Nursing, Physiotherapy, Pharmacy students in Deccan College of Medical Sciences from Aug 2022 to October 2022.

Inclusion and exclusion criteria: All the students who expressed willingness to participate were included and those who were not present and provided incomplete details were excluded.

Instrument: Self-directed learning Readiness scale (SDLRS) sketched by Fisher et al [2] to "appraise students readiness for self-directed learning, was applied, it is a valid and reliable tool". It had 21 questions consisting of three sub scales namely "Self –management (self-governance), Desire for learning (desire for studying), Self-control (self-mastery)" and was rated on a 5 point Likert scale (1=strongly disagree 2 = disagree 3 = neutral 4 = agree 5=

strongly agree) Demographic characteristics such as age>20 or <20 years and gender were noted.

Construct validity or effectiveness was established by a group of student body as per Fisher, To estimate inner equilibrium, Cronbach s coefficient alpha was utilized [9]. Subject authenticity of the questionnaire was accepted by a committee of experienced faculty using Delphi methodology [10].

Procedure: After Ethics committee approval students were given a questionnaire by Google form and time was allotted to fill the form honestly without leaving any question.

Data analysis: Data was collected and spread on a excel sheet descriptive analysis was used and ANOVA were performed using R language software to statistically evaluate the results. P value of <0.05 was considered significant

Results

The questionnaire was distributed to all students enrolled in the MBBS course (2nd year, 3rd year, 4th year) of our medical college, Physiotherapy students, Pharmacy students, Bsc Nursing. Out of 394 responses 368(94%) students provided a complete set of responses to all the items which were analyzed by removing non respondents. Maximum scores for high readiness is 105 and minimum scores were 21.Cut off scores to be considered high readiness to learn was 75% of 105 that is 80. High readiness to learn was>80, Scores <80 were considered low readiness to learn.

Table-1: Age distribution demographics				
Age distribution			**Gender distribution %**	
	Frequency	**Percentage**	**Gender**	**Percentage**
Age <20 years	92	25.09	Male	24.52
Age > 20 years	275	74.93	Female	75.48
Total	367			

Demographic factors includes age of the participants >20 were 75%and age of the participants <20 were 25% as in table 1. Also in

table 1 is that female participation is more that is 75.48% and male is 24.52%.

Sl. no	Questions	Mean	SD	Mode	Total response score
	Table-2: Mean, SD, Mode between sub-groups				
1	*Self-governance*-I am organized, planned, self-disciplined, and meticulous	3.54	1.01	4	1299
2	I classify my work well	3.61	0.95	4	1325
3	I am accountable and set specific times for my study	3.41	0.99	4	1250
4	I control my time well	3.16	1.02	4	1159
5	I arrange my work well	3.50	0.93	4	1283
6	*I set strict time period*	2.92	0.95	3	1068
7	I solve difficulties using a plan	3.55	0.92	4	1302
8	*Desire for studying*-I am willing to change my plan and analysis to learn	3.95	0.96	4	1449
9	I am willing to accept counsel from others	3.91	0.96	4	1436
10	*I prefer to set my own education target*	4.15	0.71	4	1523
11	I am aware of my own constrains	4.07	0.84	4	1495
12	I am confident in my ability to search out new details	3.89	0.83	4	1427
13	I enjoy defiance in learning	3.70	0.91	4	1359
14	I have high beliefs in my skills	3.75	0.90	4	1377
15	*Self-mastery*-I learn from my mistakes	4.03	0.85	4	1480
16	I need little help to seek new facts	3.44	0.93	4	1264
17	I critically appraise new ideas	3.65	0.78	4	1339
18	I like to reply queries/puzzles	3.74	0.88	4	1373
19	I am keen to change my design of study approach	3.53	0.97	4	1294
20	I will ask for help in my education when needed	3.85	0.96	4	1413
21	I know what teaching scheme are suitable for me in reaching my ends	3.73	0.94	4	1368

Most repeated option is 4 ref Table 2 which is for item or question 10 (4.1) which is that they agree that they can set their own learning target near to 4.1 is 4.07 which is that they are aware of their own limitations and then they agree that they learn from their mistakes 3.95 which is obtained by item 8 that the students are willing to change their ideas and thinking to learn and willing to accept advice from others and confident in their ability to search new information. Least occurring option is item 6 (2.92) students are unable to set time frames for their studies.

Regarding self-governance questions:

● When asked about whether they are organized, self- disciplined and methodical only 17% strongly agree they are 40% agree they are and 30% are neutral.

● When asked whether they categorize their work well, 47% agreed they do, 26%were neutral, only 16% strongly agreed they do. Next question as to whether they are responsible and set specific times for their study 40% agreed they do but 31% couldn't agree or disagree,14% strongly agreed that they set specific times for study.

● When asked whether they managed their time well 33% agreed, 33% remained neutral,18% disagreed ,only 10% strongly agreed they manage their time well.

● When asked about organization of work 43% agreed they organize their work well,

31% remained neutral, only 13 % strongly agreed 9% disagreed.

- When asked whether they set time frame for their study only 7% strongly agreed, 6 % strongly disagree, 40% remained neutral, 23% agreed and equal 24 % disagreed.
- The students were asked about solving problems using a plan 47% agreed they had a plan, 28% remained neutral, 14% strongly agreed, 9% disagreed 3% strongly disagreed.

In desire for studying subset questions:

- Whether they are willing to change their ideas and thinking to learn 50% agreed 29% strongly agreed 15% remained neutral 4% strongly disagree 2% disagreed. When asked whether they are willing to accept advice from others 50% agreed, 27% strongly agreed,15% remained neutral,5% strongly disagreed, and only 4% disagreed.
- When asked whether they preferred to set their own learning target, the student 56% agreed 32%, only 10% neutral 2% disagreed, They are aware of their limitations, only 1% strongly disagreed,52% agreed,32% strongly agreed,12% agreed 4% disagreed,
- Whether they are confidant in their ability to search out new information, 51 % agreed 24% strongly agreed,21% remained neutral. Asked whether they enjoy challenges in learning majority 44% agreed, 20% strongly agreed, only very little 2% strongly disagreed and 28% remained neutral. Asked whether they have strong faith in their abilities only 21% strongly agreed, 45% agreed, 27%

remained neutral, 4% disagreed, 2% strongly disagreed.

Self-mastery questions:

- Questions relating to self-control when asked about whether they learn from their mistakes, 50% agreed they do, 31% strongly agreed they do and only 13% remained neutral,4% disagreed,1% strongly disagreed. Asked whether they need minimal help to seek information 11% strongly agreed 3% strongly disagreed 32% neutral 43% agreed 10% disagreed52% agreed they critically evaluate new ideas and only 6% disagreed, 1% strongly disagreed,12% strongly agree.
- When asked whether they answered questions /puzzles, majority (52%) agreed and 18% strongly agreed and minority (3%) disagreed & strongly disagreed and 24 % remained neutral. When asked whether they are willing to change their design of study technique 45% agreed, 14% strongly agreed, 4% disagreed strongly and 14% disagreed.
- When asked whether they ask for help when needed, 58% agreed they do whereas 5.4% strongly disagreed, 21% strongly agreed and 14% remained neutral
- When asked what learning strategies are adopted in reaching their goals 48% agreed they do, 25% were neutral, 19% strongly agreed, 7% disagreed, and no one strongly disagreed.

Table-3: Batch versus age wise response score comparison								
Batch	<20 years		>20 years		n	Readiness score	%	Test	P-value
	Mean	SD	Mean	SD					
2020	75.78	9.62	75.68	9.74	157	56	35.67	0.17614	0.08605
2019	75.89	9.34	75.34	9.59	129	43	33.33	2.2523	0.0326
2018	81.48	9.35	81.44	8.69	81	53	65.43	0.021025	0.9833

Ref to Table 3: SDL Maximum scores for high readiness is 105 and minimum scores were 21. Scores <80 were considered low readiness to learn, scores >80 were considered high. Readiness to learn for 2020 batch was 56 (2nd year) followed by 2018 (4th year) 53 followed by 2019 (3rd year) which is 43. The SDL readiness scores are all less than 80 which shows low readiness to learn. There is not significant difference between <20 years and > 20 years of 2020 batch. There is significance difference in 2019 batch of students less than 20 year and more than 20 year p<.05 (0.0326).

Table-4: Stream vs gender wise response scores comparison								
Stream	**Male**		**Female**		**n**	**no of readiness**	**%**	**Test**	**P-value**
	Mean	**SD**	**Mean**	**SD**					
MBBS	74.683	9.509	72.962	8.056	195	47	24.1	1.2394	0.2179
Pharmacy & PharmaD	81	9.398	83.292	8.039	92	67	72.8	0.99418	0.03289
Physio	71.43	4.504	79.273	9.609	40	17	42.5	3.2868	0.003736
BSc-N	80.35	9.736			40	21	52.5		

In reference to Table 4 regarding gender wise comparison between MBBS, Pharmacy and Pharma D, Physiotherapy, Bsc nursing students there is not much significant difference, P value is 0.21(p>0.05) between male and females in MBBS students. There is significant difference between male and female Pharmacy students 0.03(p<0.05). There is significant difference between male and female physiotherapy students is 0.003(p< 0.05). Bsc nursing students were all female students and this test did not apply. Pharmacy and Pharma D students SDLRS score was the highest (67), then MBBS (47), followed by Bsc-N (21) and Physiotherapy (17).

Table-5: Subscale vs gender							
Sl.No	**Subscale**	**Male**		**Female**		**Test statistic**	**P-Value**
		Mean	**SD**	**Mean**	**SD**		
1	Self-management	23.26	5.97	23.80	4.59	0.7948	0.428
2	Desire for learning	27.31	3.35	27.47	3.68	0.3708	0.711
3	self-control	25.27	3.14	26.20	3.13	2.4464	0.015

Refer to table 5, in regard to subscales, the self-management subscale and desire for learning. There is not much significance between the male and female responses but in self-control subscale, there is much significant difference and p value is 0.015 (p<0.05).

Discussion

There is not much difference between the mean scores of batch 2020 and batch 2019, that is 75 and percentage obtained was around 35%. The reasons for low scores obtained by these batches can be multiple but, one of the strong reason must be COVID pandemic affecting education at all levels of learning and de motivating students. Whereas mean score of batch 2018 was 81 and percentage obtained was 65% reflecting high interest, desire and inclination to learn.

The score for self-directed learning readiness were lower among MBBS students in a study done by Premarajan and Ramalingam, the study pointed out the need to address students SDL expertise and need for ways to build SDL abilities in the students [11]. In a research done in 2020 at Chitwan Medical school to decide the readiness of nursing students for self-directed education, more than two-thirds of the nursing students were prepared. In comparison to the mean scores for self-management and desire for learning, the mean score for self-control was higher [12].

Frailty in time governance is one of the various universal aptitude identified by the battling health professionals. Though most medical students, according to Balamurugan & Kumar in a study conducted in 2015 are inclined for self-directed instruction, some are not ready and scores for learning motivation and self-control were higher than those for self-management, emphasizing the need to concentrate on this skill [13]. In order to build self-directed learners, Jennifer and Adam emphasized that it takes time and necessitates that professors change their roles from "sage on the stage" to "guide on the side" or, ideally, a true cooperative-learning [14]. In our study,

we found that students were ready to set their own education target and were aware of their own constraints.

In a systematic review that showed Self Directed Learning is distinctive with the interaction of circumstantial/ conditional influence and individual impact, Florence and Anson made notice of this. To improve pupils' learning abilities, strategies with autonomous and small group learning were successful [15]. They also ask others for help especially teacher who are motivators in their education. However, SDL was found by Kirtans and Raghavender Rao to be a successful teaching method for first-year pre-clinical subject. However, adding a didactic discourse to SDL to support education did not result in any further gains [16].

In the Department of Community Medicine in Delhi, India, a cross-sectional survey with a mixed-method profile was performed and admired by the undergraduates, although qualitative research revealed that the instructors could have done a finer task of transmitting expertise and skills [17]. If they are scheduled often, activities that increase student engagement could advance SDL. Research by Nitin and Suresh, demonstrated the crossword puzzle to be used as a dynamic teaching strategy to promote self-directed learning in the subject of pharmacology [18]. A study by Daniel, Jeremy et al. found that the concept of self-directed learning needs responsibility to population as a whole in order to be effective [19]. Students are usually unable to set to the time targets and manage clinical work and study at the same time.

A study found that there was broad consensus that doctors imparting education should be self-directed learners and that teachers need training in scholastic methods promoting SDL [20]. Teachers are supposed to motivate students and be mentors in their teaching and learning. A Chinese study found that self-directed learning was a trustworthy predictor of rational accomplishment [21]. In another study done in 2021 by Nadeem and Ahmed. The study's relatively low ratings indicated that self-directed learning cannot be relied upon to ensure that pupils learn as much as possible [22]. Short-form scale for self-directed readiness in Fisher and King learning is a "rational and definitive device, as claimed by Maryam and Mohammed in 2019 [23]. There are many reasons for low scores in our study, which may be due to Covid pandemic, students having online studies and that it didn't motivate them enough.

A systematic review by Tracey A H Taylor , Kyeorda Kemp suggest that SDL assessment procedures within undergraduate teaching differ immensely, as distinct aspects of SDL were practiced by various groups of students to meet divergent learning requirements and professional promotion demands[24]. The SDLRS scale helps medical educators assess students learning needs to be able to implement teaching strategies best suited to the students. Use of the readiness assessment may be able to provide valuable data for curriculum development.

SDL is widely utilized in India to deliver health care professionals education especially after the introduction of CBME curriculum. Its preparation and evaluation presents challenges, therefore faculty must adopt a more proactive stance to ensure that it is effectively completed and advantageous to the students [25].

Limitations: The limitations of this study are, that the CBME curriculum was not implemented initially and later Pandemic played a very vital role in de motivating the students which was detrimental to them for losing interest in academics leading to low scores in the readiness scale.

Conclusion

Self-directed learning is a very essential part of life-long learning skill and students scores reflect their readiness to learn and also needs to be improved by further follow up studies to see its effectiveness in the new Competency Based Medical Education.

Financial Support and sponsorship: Nil   **Conflicts of interest:** There are no conflicts of interest.

References

1. Knowles MS. Self-directed learning: A guide for learners and teachers. New York, NY: *Association Press.* 1975.
2. Murray Fisher M, King J and Tague G. Nurse Education Today. *Harcourt Publishers Ltd.* 2001; 21:516-525.
3. Lapidow E, Walker CM. Rethinking the "gap": Self-directed learning in cognitive development and scientific reasoning. *Wiley Interdiscip Rev Cogn Sci.* 2022; 13(2):e1580.
4. Rathore, Bharti & Chopra, Deepti. Self-directed learning: assessment of students' abilities and their perspective. *AJP Advances in Physiology Education.* 2020; 44:383-386.
5. Charokar K, Dulloo P. Self-directed Learning Theory to Practice: A Footstep towards the Path of being a Life-long Learne. *J Adv Med Educ Prof.* 2022; 10(3):135-144.
6. Jeon J, Park S. Self-Directed Learning versus Problem-Based Learning in Korean Nurse Education: A Quasi-Experimental Study. *Healthcare (Basel).* 2021; 9(12):1763.
7. Gidding S. Self-Directed Learning (SDL) in Higher Education: A Necessity for 21st Century Teaching and Learning. [Thesis, Teaching and Learning in Higher Education, Faculty of Education, Brock University St. Catharines, Ontario]. 2015. Available from: *http://dx.doi.org/10.13140/RG.2.1.2446.7365*
8. Guglielmino, L.M. The case for promoting self-directed learning in formal educational institutions. *SA-Educ Journal.* 2013; 10:1-18.
9. Fisher MJ, King J. The self-directed learning readiness scale for nursing education revisited: a confirmatory factor analysis. *Nurse Educ Today.* 2010; 30:44-48.
10. de Villiers MR, de Villiers PJ, Kent AP. The Delphi technique in health sciences education research. *Med Teach.* 2005; 27(7):639-643.
11. Kar SS, Premarajan K C, Ramalingam A, Iswarya S, Sujiv A, Subitha L. Self-directed learning readiness among fifth semester MBBS students in a teaching institution of South India. *Educ Health*. 2014; 27:289-292.
12. Singh, Indu & Paudel, Binita. Readiness for self-directed learning among nursing students in a medical college. *Citwan Journal of Chitwan Medical College.* 2020; 10:27-30.
13. Balamurugan S & Kumar H. Self-directed learning readiness (SDLR) among medical students: a questionnaire-based study from an Indian medical school. *South-East Asian Journal of Medical Education.* 2015; 9:59.
14. Robinson JD, Persky AM. Developing Self-Directed Learners. *Am J Pharm Educ.* 2020; 84(3):847512.
15. Wong FMF, Tang ACY, Cheng WLS. Factors associated with self-directed learning among undergraduate nursing students: A systematic review. *Nurse Educ Today.* 2021; 104:104998.
16. Pai KM, Rao KR, Punja D, Kamath A. The effectiveness of self-directed learning (SDL) for teaching physiology to first-year medical students. *Australas Med J.* 2014; 7(11):448-453.
17. Patra S, Khan AM, Upadhyay MK, Sharma R, Rajoura OP, Bhasin SK. Module to facilitate self-directed learning among medical undergraduates: Development and implementation. *J Educ Health Promot.* 2020; 9:231.
18. Gaikwad N, Tankhiwale S. Crossword puzzles: self-learning tool in pharmacology. *Perspect Med Educ.* 2012; 1(5-6):237-248.
19. Ricotta DN, Richards JB, Atkins KM, Hayes MM, McOwen K, Soffler MI et al. (on behalf of Millennium Conference 2019 writing group). Self-Directed Learning in Medical Education: Training for a Lifetime of Discovery. *Teach Learn Med.* 2022; 34(5):530-540.
20. Lim YS, Lyons VT, Willey JM. Supporting Self-Directed Learning: A National Needs Analysis. *Med Sci Educ.* 2021; 31(3):1091-1099.
21. Li J, Yang D, Hu Z. Wuhan College Students' Self-Directed Learning and Academic Performance: Chain-Mediating Roles of Optimism and Mental Health. *Front Psychol.* 2022; 12:757496.
22. AlRadini F, Ahmad N, Ejaz Kahloon L, Javaid A, Al Zamil N. Measuring Readiness for Self-Directed Learning in Medical Undergraduates. *Adv Med EducPract.* 2022; 13:449-455.
23. Fooladvand M, Nadi MA. Validation of revisited self-directed learning readiness scale for nursing education among Iranian nursing and midwifery students. *J Educ Health Promot.* 2019; 8:266.
24. Taylor TAH, Kemp K, Mi M, Lerchenfeldt S. Self-directed learning assessment practices in undergraduate health professions education: a systematic review. *Med Educ Online.* 2023; 28(1):2189553.
25. Shrivastava SR, Shrivastava PS. Self-directed learning in undergraduate medi al education in India: Addressing the existing challenges and exploring the strategies for its successful implementation. *Med J DY Patil Vidyapeeth.* 2022; 15:795-797.

*All correspondences to: Dr. Neeraj Sadiq, Associate Professor Department of Pharmacology, Deccan College of Medical Sciences, P.O. Kanchanbagh, DMRL 'X' Road, Santhosh Nagar, Hyderabad-500058, Telangana, India. E-mail: neerajsadiq2013@gmail.com