

# A Study of the Learning Approaches of Medical Students before and after Clinical Posting in a Medical College in South India

Suzanne Maria D'cruz<sup>1</sup>, Navin Rajaratnam<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Physiology, Sri Muthukumaran Medical College Hospital and Research Institute, The Tamil Nadu Dr. M.G.R Medical University, Chennai, Tamil Nadu, India, <sup>2</sup>Professor, Department of Physiology, Karpaga Vinayaga Institute of Medical Sciences and Research Centre, Maduranthagam, The Tamil Nadu Dr. M.G.R Medical University, Kanchipuram, Tamil Nadu, India

## Abstract

**Introduction:** Students use either a deep or a surface learning approach focusing on understanding or memorizing, respectively. Learning approaches vary depending on the learning environment, curricula followed and year of study.

**Aim:** The aim of this study was to compare the learning approaches of medical students before and after they start their clinical posting.

**Materials and Methods:** The revised two-factor study process questionnaire (R-SPQ-2F) was administered to 93 second-year medical students of Sri Muthukumaran Medical College Hospital and Research Institute aged 19–20 years who were posted in the Departments of General Medicine and Surgery before and after 3 months of their clinical posting. Deep and surface learning approach main scores were determined.

**Results:** The majority (87.1%) of medical students in our study had a deep learning approach, and there was no change after their clinical posting. There was no significant difference in the deep approach and surface approach main scores and subscale scores before and after their clinical posting. The majority felt that studying was more satisfying (94%), interesting (92%), and exciting (76%) and they felt like working harder (75%) and learning more deeply (82%) because they had seen patients. The majority agreed that after seeing patients, they try to understand concepts (94%), relate new to previous knowledge (84%), logically analyze information (86%), and study out of curiosity (91%) to master the subject (84%).

**Conclusion:** The majority of medical students had a deep approach to learning before starting their clinical posting and perceived that seeing patients during their clinical posting had a positive effect on their learning, although no statistically significant difference was found in learning approach scores.

**Key words:** Clinical posting, Learning approach, Medical students, Revised two-factor study process questionnaire

## INTRODUCTION

Students have been found to use either a deep or a surface learning approach focusing on understanding or memorizing, respectively.<sup>[1]</sup> The choice of preferred

learning approach depends on the learning environment.<sup>[2]</sup> Students' learning approaches can be determined using instruments such as the revised two-factor study process questionnaire (R-SPQ-2F).<sup>[1]</sup> While students who use a deep learning approach are intrinsically motivated to learn and focus on understanding study material, students who use a surface learning approach memorize facts without understanding them fully. Such students with a surface approach are motivated by fear of failure – their motivation to learn is extrinsic and they aim to just memorize and reproduce study material in examinations. Intrinsically motivated students with deep learning approaches, learn for understanding and mastery, intending to correlate

### Access this article online



www.ijss-sn.com

**Month of Submission :** 04-2018  
**Month of Peer Review :** 05-2018  
**Month of Acceptance :** 06-2018  
**Month of Publishing :** 06-2018

**Corresponding Author:** Dr. Navin Rajaratnam, Department of Physiology, Karpaga Vinayaga Institute of Medical Sciences and Research Centre, GST Road, Chinnakolambakkam, Palayanoor, Maduranthagam, Kanchipuram - 603 308, Tamil Nadu, India. Phone: +91-9894543731. E-mail: drnavinr@gmail.com

new knowledge with existing knowledge, with a focus on application.<sup>[3]</sup>

Generally, the aim of our educational systems should be to encourage students to adopt a deep approach to learning subjects crucial for their development.<sup>[3]</sup> Medical students too, like all other students, use either deep or surface learning approaches. Researchers have studied the learning approaches of medical students in different years of study intending to determine if there is any change as they progress through medical school. While 1<sup>st</sup>-year medical students have been found to have low deep approach scores,<sup>[4]</sup> a subsequent decline,<sup>[5]</sup> or no change<sup>[6]</sup> in deep approach scores has also been observed. Other factors have also been found to affect medical students' learning approaches – A deep learning approach has been found to be promoted by a problem-based learning (PBL) curriculum and clinically oriented teaching.<sup>[7,8]</sup>

Paudel *et al.* found that medical students in their preclinical (basic science) years of medical education at Trinity School of Medicine adopted the deep learning approach more than the surface approach.<sup>[9]</sup> They also found a positive correlation between deep learning approach scores and academic performance.<sup>[9]</sup> Sandover *et al.* found a significant and consistent difference between the learning approaches of undergraduate (UG) and Graduate Entry Medical Program (GEMP) students of the University of Western Australia over 5 years (from 2007 to 2011), the GEMP students preferring a deep learning approach and the UG students preferring a superficial learning approach to learning, the difference being more evident in the clinical years.<sup>[10]</sup> Recently, Chonker *et al.* who studied the learning approaches of 250 medical students with different backgrounds from various medical schools who attended the obstetrics and gynecology clinical rotation in a hospital at Singapore, found that the majority of students predominantly utilized the deep and strategic learning approaches and that learning approaches were not influenced by demographic characteristics such as age and gender.<sup>[11]</sup> A positive correlation between 4<sup>th</sup>-year medical students' deep learning approaches and performance on a summative high-stakes clinical performance examination has also been noted.<sup>[12]</sup>

Generally, medical students in India study basic sciences in their 1<sup>st</sup> year of study and encounter patients only in their 2<sup>nd</sup> year. Knowledge of basic sciences provides the basis for medical students' understanding not only of patients' clinical features but also helps them understand the pathogenesis and management of different diseases that patients they subsequently encounter suffer from. Recent reforms in medical education in India have favored and recommended early clinical exposure of medical students by proposing to expose even 1<sup>st</sup>-year medical

students to patients – either actual or standardized patients or patient videos or paper cases.<sup>[13]</sup> In the recent Vision 2015 document, the Medical Council of India (MCI) has recommended various curricular reforms such as early clinical exposure of UG students and student–doctor methods of clinical training so that students understand the relevance and practical application of basic science (Anatomy, Physiology, and Biochemistry) subject matter that they study.<sup>[13]</sup> Medical colleges are in different stages of implementing these reforms. Our institution has introduced early clinical exposure. Since some researchers have found that the 1<sup>st</sup>-year medical students have lower scores on the deep approach when compared to medical students in subsequent years;<sup>[4]</sup> theoretically, it is possible that exposure to patients in the hospital (or even early clinical exposure) could promote a deep approach to learning in a short duration. Results could also however vary between different institutions depending on the learning environment.

In view of the varied findings of other researchers regarding learning approaches of medical students in various years of study and the effect of clinically oriented teaching, we were interested in determining the learning approaches of medical students in our institution before they start their clinical posting, with an aim of comparing it with their learning approaches after their clinical posting. The objectives of this study were to compare the percentage of medical students with a deep and surface learning approach, before and after clinical posting and to compare the deep and surface learning approach scores of Indian medical students before and after their clinical posting using the R-SPQ-2F.<sup>[1]</sup>

## MATERIALS AND METHODS

After obtaining the required Institutional Ethical Committee clearance and written informed consent from the participants, the R-SPQ-2F<sup>[1]</sup> was administered to 93 medical students of Sri Muthukumaran Medical College Hospital and Research Institute in Chennai, South India, aged 19–20 years who were posted in the Departments of General Medicine and Surgery before starting their clinical posting and after 3 months of their clinical posting.

The R-SPQ-2F, like the earlier Bigg's SPQ, is used to determine learning approaches of students.<sup>[1]</sup> The R-SPQ-2F, which has just surface and deep approaches and a motive and strategy score for each approach is a simple, revised, short two-factor version of the SPQ.<sup>[1]</sup> The SPQ scores give information on the student's preferred, ongoing and contextual approaches to learning and give a good idea about the presage, process, and product levels of Bigg's "Presage-Process-Product model" of the learning process – it describes how each student differs within a

particular teaching context; how each student handles a specific task; and how different teaching contexts differ from each other.<sup>[1,14]</sup> The R-SPQ-2F has twenty questions, each student was instructed to choose the single best response to each question about their usual way of studying from which deep approach and surface approach main scores and the motive and strategy subscale scores were determined.<sup>[1]</sup> A pretested validated questionnaire was also administered after 3 months of their clinical posting to elicit their perceptions about the effect of clinical posting on their learning approaches.

Deep and surface approach scores of the medical students before and after 3 months of clinical exposure were compared using SPSS 17 software and the paired Student's *t*-test; while McNemar's test was used to compare the percentage of medical students with each learning approach before and after their clinical posting.

## RESULTS

This study conducted to compare the learning approaches of medical students before and after their clinical posting in a medical college in South India revealed the following results:

The majority (87.1%) of medical students in our study had a deep learning approach, and there was no change after their clinical posting [Table 1]. There was no significant difference in the deep approach and surface approach main scores and the motive and strategy subscale scores of the participants before and after their clinical posting [Table 2].

Analysis of the students' perceptions of the effect of clinical posting on their learning approaches revealed that the majority of students felt that studying was more satisfying (94%), interesting (92%), and exciting (76%) and they felt like working harder (75%) and learning more deeply (82%) because they had seen patients during their clinical posting. The majority agreed that after seeing patients, they try to understand concepts (94%), relate new to previous knowledge (84%), logically analyze information (86%), and study out of curiosity (91%) to master the subject (84%).

## DISCUSSION

Our study revealed that the majority (87.1%) of medical students had a deep approach before starting their clinical posting. Our results are contrary to those of Newble and Gordon who studied the learning approaches of 1<sup>st</sup>, 3<sup>rd</sup>, and final-year medical students and found that the 1<sup>st</sup>-year medical students had low scores on the deep approach.<sup>[4]</sup> Our results also are in contrast to the results of McDonald *et al.*

**Table 1: Comparison of the learning approaches of medical students before and after clinical posting**

Learning approach	n=93 (%)		P value
	Before	After	
Deep	81 (87.1)	81 (87.1)	1.00
Surface	8 (8.6)	11 (11.8)	0.581
Equal	4 (4.3)	1 (1.1)	0.375

Learning approaches of medical students before and after 3 months of clinical posting expressed as the number and the percentage (in brackets) of medical students who had a deep or surface learning approach and equal scores for both learning approaches; P value calculated using Mc Nemar's test, P<0.05 being considered significant

**Table 2: Comparison of the learning approach scores of medical students before and after clinical posting**

Scale	Before	After	P value
DA	32.86±5.41	32.85±5.63	0.985
SA	22.26±6.54	22.50±6.10	0.715
DM	17.12±2.97	16.86±3.28	0.452
DS	15.74±3.28	15.99±3.21	0.515
SM	9.75±3.52	10.29±3.52	0.145
SS	12.51±3.73	12.20±3.45	0.465

Learning approaches scores of medical students before and after 3 months of clinical posting expressed as the means and standard deviations of DA and SA main scores (Max=50) and the DM, DS, SM, and SS subscale scores (Max=25) obtained using the R-SPQ-2F; P value obtained using paired Student's *t*-test, P<0.05 being considered statistically significant. DA: Deep approach, SA: Surface approach, DM: Deep motive, DS: Deep strategy, SM: Surface motive, SS: Surface strategy, R-SPQ-2F: Revised two-factor study process questionnaire

who followed a cohort of students studying Physiology and Anatomy (two of the subjects that our medical students study in their 1<sup>st</sup> year of study) as their majors for a science degree over 3 years to determine if there was any change in learning approach. They found that a surface approach was predominantly favored by the 1<sup>st</sup>-year students.<sup>[15]</sup> The findings of the present study are in agreement of those of Paudel *et al.* who also found that 1<sup>st</sup>-year medical students had a deep learning approach.<sup>[9]</sup> Our earlier studies however have demonstrated that the majority of 1<sup>st</sup>-year medical students studying in different Indian medical colleges in which a didactic, nonproblem-based curriculum was followed had a deep approach to learning.<sup>[16,17]</sup> The learning approaches of the participants in the present study were determined before they began their clinical posting in their 2<sup>nd</sup> year, which effectively could be considered being their learning approaches at the end of their 1<sup>st</sup> year of study, again involving a predominantly didactic, nonproblem-based curriculum, the only difference being the introduction of the curricular reform of early clinical exposure.

The majority of medical students in our study perceived that seeing patients during their clinical posting had a positive effect on their learning, although no statistically significant difference was found in learning approach scores. One possible explanation for this finding could be

the fact that their deep approach scores were already high. This could explain why in spite of a perceived positive effect of the clinical posting, there was no significant further increase in deep learning approach scores. A similar finding was observed by Wilson and Fowler who concluded that students already taking a deep approach do not shift in their approach to deep learning in response to a change in learning environment – they were consistent in their approaches across different environments.<sup>[18]</sup>

We can only postulate that the early clinical exposure being practiced in the institution as part of curricular reforms could have accounted for the deep approach scores of the participants. Given the fact that data about the participants' baseline learning approach scores at the start of their 1<sup>st</sup> year of study were unavailable and given that there were no control groups/cohorts to compare with, this cannot be assumed to be the only cause for the findings, however. Early clinical exposure took the form of paper cases being discussed and patient's videos being shown to students during their course of study in the 1<sup>st</sup> year and to an extent could have been instrumental in demonstrating relevance of study material and its application which would favor a deep learning approach. However, while some researchers have found that the deep approach to learning was promoted when curricula where PBL and clinically oriented teaching was followed,<sup>[7,8]</sup> Reid *et al.*, however, found little significant change and Balasooriya *et al.* found that students moved in the opposite direction and adopted a more surface approach after reforms aiming to promote a deep learning approach were initiated.<sup>[6,19]</sup>

Limitations of the study include the fact that results of this study cannot be generalized since the students' approaches would be dependent on the teaching context in each specific institution. The lack of baseline data on the participants learning approaches on entry into medical college, the absence of a control group, the short duration of the study, the self-reporting nature of the questionnaire, and the possibility of social desirability bias are other limitations. Further studies to follow-up the cohort over a longer period and the use of qualitative methods are planned and could provide more information.

## CONCLUSION

The majority of medical students had a deep approach to learning before starting their clinical posting and perceived that seeing patients during their clinical posting had a

positive effect on their learning, although no statistically significant difference was found in learning approach scores. Reasons could be their high deep approach scores (possibly due to early clinical exposure) and the short study duration. Lack of baseline data is a limitation. Follow-up after 1 year and focused group discussions are planned.

## REFERENCES

1. Biggs JB, Kember D, Leung DYP. The revised two factor study process questionnaire: R-SPQ-2F. *Br J Educ Psychol* 2001;71:133-49.
2. Serife AK. A conceptual analysis on the approaches to learning. *Educ Sci Theory Practice* 2008;8:707-20.
3. Felder RM, Brent R. Understanding student differences. *J Eng Educ* 2005;94:57-72.
4. Newble DI, Gordon MI. The learning style of medical students. *Med Educ* 1985;19:3-8.
5. Wickramasinghe DP, Samarasekera DN. Factors influencing the approaches to studying of preclinical and clinical students and postgraduate trainees. *BMC Med Educ* 2011;11:22.
6. Reid WA, Evans P, Duvall E. Medical students' approaches to learning over a full degree programme. *Med Educ Online* 2012;17:17205.
7. Abraham RR, Vinod P, Kamath MG, Asha K, Ramnarayan K. Learning approaches of undergraduate medical students to physiology in a non-PBL- and partially PBL-oriented curriculum. *Adv Physiol Educ* 2008;32:35-7.
8. Mogre V, Amalpa A. Approaches to learning among Ghanian students following a PBL-based medical curriculum. *Educ Med J* 2015;7:e38-44.
9. Paudel KR, Nepal HP, Shrestha B, Panta R, Toth S. Distribution and academic significance of learning approaches among pre-clinical medical students at Trinity School of Medicine, St Vincent and the Grenadines. *J Educ Eval Health Prof* 2018;15:9.
10. Sandover S, Jonas-Dwyer D, Marr T. Graduate entry and undergraduate medical students' study approaches, stress levels and ways of coping: A five year longitudinal study. *BMC Med Educ* 2015;15:5.
11. Chonkar SP, Ha TC, Chu SS, Ng AX, Lim ML, Ee TX, *et al.* The predominant learning approaches of medical students. *BMC Med Educ* 2018;18:17.
12. May W, Chung EK, Elliott D, Fisher D. The relationship between medical students' learning approaches and performance on a summative high-stakes clinical performance examination. *Med Teach* 2012;34:e236-41.
13. Medical Council of India (Homepage on the Internet). Vision; 2015. Available from: [https://www.old.mciindia.org/tools/announcement/MCI\\_booklet.pdf](https://www.old.mciindia.org/tools/announcement/MCI_booklet.pdf). [Last accessed on 2018 Jan 08].
14. Biggs J. What do inventories of students' learning processes really measure? A theoretical review and clarification. *Br J Educ Psychol* 1993;63:3-19.
15. McDonald F, Reynolds J, Bixley A, Spronken-Smith R. Changes in approaches to learning over three years of university undergraduate study. *Teach Learning Inq* 2017;5:65-79.
16. Rajaratnam N, D'cruz SM, Chandrasekhar M. Correlation between the learning approaches of first year medical students and their performance in multiple choice questions in physiology. *Natl J Integr Res Med* 2013;4:43-8.
17. Rajaratnam N, Suganthi V, D'cruz SM. Correlation between the learning approaches and perceived stress of first year medical students. *S East Asian J Case Rep Rev* 2013;2:289-99.
18. Wilson K, Fowler J. Assessing the impact of learning environments on students' approaches to learning: Comparing conventional and action learning designs. *Assess Eval Higher Educ* 2005;30:87-10.
19. Balasooriya CD, Hughes C, Toohey S. Impact of a new integrated medicine program on students' approaches to learning. *Higher Educ Res Dev* 2009;28:289-302.

**How to cite this article:** D'cruz SM, Rajaratnam N. A Study of the Learning Approaches of Medical Students before and after Clinical Posting in a Medical College in South India. *Int J Sci Stud* 2018;6(3):95-98.

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