International Journal of Health Sciences and Research
[Indexed, Peer-Reviewed Journal]
Volume 15; Issue: 11; November 2025
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Assessment of Reflective Capacity and Its Association with Self-Directed Learning and Clinical Competency in Final Year Physiotherapy Students: A Cross-Sectional Study

Shruti Prabhakaran Nair[1], Bhavana Suhas Mhatre[2], Vrushali Prashant Panhale[3]

[1]Associate Professor, MGM College of Physiotherapy, Navi Mumbai;
PhD Scholar, Physiotherapy School & Centre, Seth GS Medical College & KEM Hospital, Mumbai.
[2]Professor (contract), Physiotherapy School & Centre, Seth GS Medical College & KEM Hospital, Mumbai.
[3]Professor, MGM College of Physiotherapy, Navi Mumbai.

Corresponding author: Dr. Shruti Prabhakaran Nair (PT)

DOI: https://doi.org/10.52403/ijhsr.20251114

ABSTRACT

Background: The ability to reflect on one's performance is a crucial skill for personal and professional development. In health professions, it is necessary to cultivate learners who along with being a skilled clinician, have the aptitude for problem-solving, clinical reasoning, critical thinking and self-regulated learning leading to life-long learning. Reflection is one of the processes that provide the possibility of cultivating and creating such capacities in these learners. This study aimed to explore association of reflective thinking with self-directed learning and clinical competency of final year Physiotherapy students.
Methodology: This was a cross-sectional study conducted among thirty final year Physiotherapy students at a single institute affiliated to a state health science university. Reflective capacity of students was assessed using Kember's reflection thinking questionnaire (RTQ). Self-directed learning and clinical competency were assessed using self-rating scale of self-directed learning (SRSSDL) and Assessment of Physiotherapy Practice (APP) tool respectively. Data was analysed using SPSS software version 25. Association between the variables was assessed using Spearman's ranked order correlation test.
Results: Study included 30 Physiotherapy final BPTh students having mean age of 21.20±1.09 years with 16.67 %(n=05) males and & 83.33% (n=25) females. Mean scores of RTQ was found to be 60.71(7.21). Reflective capacity showed a statistically significant weak positive correlation with SRSSDL score ($r=0.34$, $p\leq0.05$) but didn't not have a significant correlation with APP score ($r=0.12$, $p=0.54$).
Conclusion: Present study found that Physiotherapy students demonstrated some reflective potential that correlated with their self-directed learning; however, it did not show any relation with their clinical competency.

Key-words: reflection, clinical competence, self-directed learning, learner, thinking, questionnaire

INTRODUCTION

Reflection is considered as a metacognitive phenomenon that can occur before, during, and after the learning process so as to enhance the overall understanding of both the self and the situation to enable better performance in similar future settings. [1,2] Reflecting and thinking on the learning experience have been emphasized as key factors in the learning process.[3]

The process of reflection can enable students to grasp a concept better, expand their horizons, and make conscious decisions for upcoming activities by reflecting on their learning experiences. [4] Reflective learning is of relevance to the education of professionals, as it encourages students to integrate theory with practice. Reflective practices were found to be significant predictors of self-directed learning competencies.[5] A study by Shanta Dutta (2023) demonstrated that reflection and peer assessment practice are conducive to the development of critical thinking and self-directed learning among students, which can augment their learning experiences at the university level.[4]

Self-directed learning as defined by Knowles is "a process in which individuals take the initiative, with or without the help of others, in diagnosing their needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes." [6-8] Its very important for health-care students to develop self-directed learning. There are many tools to evaluate SDL of students such as Fisher's 40-item Self-Directed Learning Readiness Scale, Self-Directed Learning Instrument (SDLI), Self-rating scale of SDL (SRSSDL).[9] Numerous studies have been reported in medical and nursing discipline with respect to self-directed learning readiness.[9-12] Despite the similar academic rigor framework as for medical and nursing, there have been very limited literature about SDL readiness in Physiotherapy students.

Physical therapy requires the integration of knowledge, skills and attitude for effective patient care making them competent professionals. Clinical competence is defined as use of technical and communication skills, knowledge, clinical reasoning, emotions and values in clinical settings. It also refers to the ability to carry out professional functions effectively in the area of practice.[13] It is commonly assessed using direct observation through methods like Directly Observed Procedural Skills (DOPS), mini-Clinical Evaluation Exercise (mini-CEX), Assessment of Physiotherapy Practice (APP) tool or through objective structured assessments like Objective Structured Clinical Examinations (OSCEs), and self-evaluation tools such as portfolios. [14] APP tool developed by Dalton was found to be a reliable and valid instrument for assessing the entry-level clinical competence of physiotherapy students by evaluating seven key domains, including communication, assessment, analysis, planning, intervention, evidence-based practice, and risk management, across multiple clinical placements. [15-16]

Reflective practice is crucial for developing and enhancing clinical competency in healthcare professionals. Reflective thinking is important for functioning in dynamic and complex situations, for refreshing knowledge and to solve complex problems. A study by Kanaga Kumari Chelliah showed that reflective practice promotes the development of clinical competencies in medical imaging undergraduates. [17]

Physiotherapy as a profession requires learners to possess the ability for problem-solving, clinical reasoning, critical thinking and self-regulated learning with the goal of being a life-long learner.[18] Reflection is one of the processes that provide the possibility of cultivating and creating such capacities in the learners. Owing to the dearth of literature exploring these important learning outcomes in Physiotherapy students, this study aimed to explore association of reflective capacity with self-directed learning and clinical

competency of final year Physiotherapy students.

MATERIALS AND METHODS

This cross-sectional observational study included thirty final year Bachelor of Physiotherapy (BPTh) students from a single Physiotherapy institute affiliated to a state health science university. The research was approved by the institutional ethical committee. All the participants were given a detailed explanation about the purpose of the study and a written informed consent was obtained from each one of them. Additionally, assurance regarding data confidentiality was provided. Students who were absent on the day of recruitment and those who didn't provide consent to participate were excluded.

Reflective capacity was assessed using a 16-item Kember's Reflective Thinking Questionnaire. [19] Participants were instructed to indicate their level of agreement to each of the item on a five-point Likert scale ranging from strongly agree to strongly disagree and the total score was documented. The self-rating scale of self-directed learning (SRSSDL), developed by Williamson was used to evaluate the self-directed learning readiness.[20] Participants responses for every statement in the 60-item scale were recorded using a five-point rating scale was recorded and the total score was noted. The total score was categorized into three levels indicating SDL readiness: low level (60-140); moderate level (141-220); and high level (221-300).

Students' clinical competency was assessed by a clinical supervisor while they evaluated patients in their clinical postings using a 20-item Assessment of Physiotherapy Practice (APP)tool which is a standardised, reliable and valid clinical assessment tool. [15-16] They were scored from 0 to 4 (whereby 0 or 1 = not yet adequately competent; 2 =entry-level standard; 3 = demonstrates comfort; 4 = demonstrates sophistication) for every item in the APP tool. For each student, a mean overall grade was calculated.

DATA ANALYSIS:

Data were analysed using the Statistical Package for the Social Sciences software version 25.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics were used to describe the demographic characteristics of the students. Mean and standard deviation values were calculated for continuous variables. Categorical variables were reported as proportions and percentages. $P \leq 0.05$ was considered as statistically significant. Normality of the data was assessed using Shapiro Wilk test. Since the data was not normally distributed, correlation between the variables was assessed using Spearman's ranked order correlation test.

RESULTS

Study included 30 Physiotherapy final BPTh students having mean age of 21.20±1.09 years with 16.67 %(n=05) males and & 83.33% (n=25) females. Mean values of the scores of RTQ, SRSSDL and APP are presented in Table 1. Almost 83.3% (n=25) participants demonstrated high SDL whereas 16.67%(n=5) showed moderate scores. Mean average score of APP scale was found to be 2.08(0.53) which indicated that students demonstrated most performance indicators to adequate levels.

Table 1 showing the Mean and standard deviation values of the outcome variables.

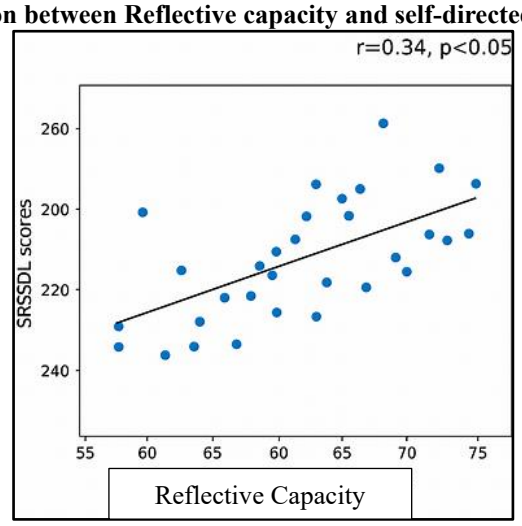
	Outcome variables	**Mean**	**SD**
Reflective Capacity	RTQ score		
	Habitual action	14.03	3.71
	Understanding	17.32	2.27
	Reflection	17.03	1.99
	Critical reflection	16.36	2.58
	Overall	60.71	7.21
Self-directed learning	SRSSDL Scores		
	Awareness	47.70	5.48
	Learning strategies	44.03	5.94

	Learning activities	44.43	5.36
	Evaluation	43.40	6.32
	Inter-personal skill score	42.93	8.42
	Overall	222.58	24.90
Clinical Competency	APP scores		
	Mean grade	2.07	0.53

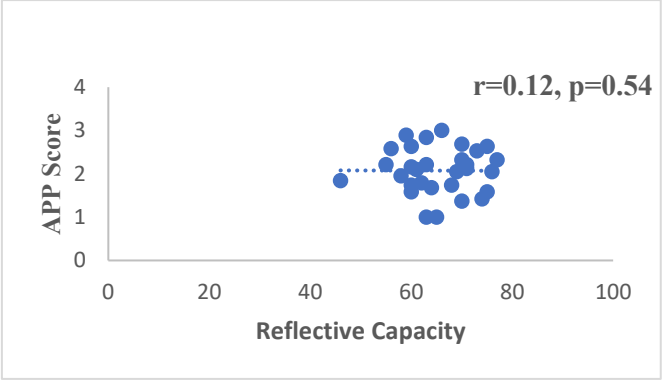
SD: Standard Deviation, RTQ: Reflective Thinking Questionnaire, SRSSDL: Self-rating scale of self-directed learning, APP: Assessment of Physiotherapy Practice

Reflective capacity was found to have a weak positive correlation with SRSSDL score (r=0.34, p≤0.05) which was statistically significant. It didn't show any significant correlation with clinical competency (r=0.12, p=0.54) [Graph 1 & 2]

Graph 1 showing correlation between Reflective capacity and self-directed learning (SRSSDL scores)



Graph 2 showing correlation of Reflective capacity and clinical competency (APP score)



DISCUSSION

Present study assessed reflective capacity of final year undergraduate Physiotherapy students and aimed to establish its correlation with self-directed learning and clinical competency.

Reflective capacity assessed using Kember's Reflective Thinking Questionnaire showed higher scores in understanding and reflection domain compared to habitual domain which relatively scored less. It was surprising to note that despite of not been exposed to the concept of reflection, students demonstrated reflective potential which as explained by Kember is the process of internally examining and exploring an issue of concern, triggered by an experience, that clarifies meaning in terms of self, resulting in a changed conceptual perspective". [19]The reflection domain identifies the learner's role in problem-solving exercises whereas the understanding is when the learner tries to

comprehend the knowledge gained and apply it contextually when required.[19] This study findings have been compared with those of Kember et al (2000) study in which the questionnaire was completed by 303 students from eight courses (occupational therapy, physiotherapy, radiography and nursing) in the health science faculty of a university in Hong Kong. [19] Another study by Khalid et al;(2017) exploring reflective capacity of students pursuing Computer in Education course showed that students demonstrated higher mean values of Understanding domain followed by Reflection over habitual action.[21]

SDL as assessed by Williamson's questionnaire showed a mean value of 222.58(24.90) with students scoring better in awareness domain compared to inter-personal skill score. Majority of them (73.33%, n=22) demonstrated high SDL potential. Present study showed that reflective thinking showed a statistically significant weak positive correlation with self-directed learning of students. Hyun Kyung Lee et al; study in second language university classes showed that effective reflective practices help students become self-directed learners.[5] Though the present study explored association between reflective capacity and SDL readiness among students it didn't study the implementation of reflective writing on their SDL potential. By self-reflecting on their work, students can gain clear insights of the what, how, and why of their learning process. Thus, encouraging students to self-reflect on their learning provides opportunities for them to diagnose their own learning needs, select appropriate strategies, and plan for the next step towards their learning objectives, and these activities are related to SDL competencies from Knowles. [6] This is also consistent with Patterson et al. (2002) that proposed that a crucial competency required for students to become self-directed learners is reflection. [22]

Aydoğmuş & Şentürk have reiterated that reflective thinking provides students with the tools to evaluate their learning strategies and adjust to new academic expectations .[23] Reflection leads to "transformational learning" and learners gain an understanding of their responsibility in providing health care; moreover, it promotes self-awareness, clinical insight, and quality of care, stress management and teamwork , and empathy and professionalism, and it helps clinicians make difficult or ethical decisions when faced with complex cases in clinical practice .[3]

Clinical competency as assessed using APP scale indicated that students demonstrated most performance indicators to adequate levels. However reflective capacity score didn't show any correlation with clinical competency of participants. More than half of the cohort only exhibited adequate level of clinical competency. Since the participants belonged to final year under-graduate program, they were still in the process of developing these skills. Final year mainly focusses on learning various management strategies which students eventually master it once they start treating patients independently by the time they graduate as interns.

A study by Kanaga Kumark Chellian (2012) demonstrated the effectiveness of incorporating reflective practice in developing clinical competency of medical imaging undergraduates. [17] Though reflective behaviour is proven to be beneficial for the development and strengthening of good doctor-patient relationships and, thereby improved clinical outcomes [1,24], students in the present study were not exposed to training in reflections and were just in the early phase of treating patients in the clinical postings. This could be the possible reason for not having found a significant relation between the two. Morever, reflective capacity was assessed at single point of time by a questionnaire which need not necessarily translate or explain the reflective thinking potential of a student impacting their clinical skills.

Shrivastav et al; has emphasized encouraging reflective behaviour among medical students and faculty members to be the need of hour

so as to improve their clinical competence and their behaviour in future circumstances.[25] It helps clinicians make difficult or ethical decisions when faced with complex cases in clinical practice .[26] Besides clinical competency depends on various factors such as the clinical learning environment, individual student characteristics, and the quality of education and training received which were not explored in detail.[27] Future scope could focus on engaging students in case-based reflective activities [28] to assess if reflection played a significant role in developing their competencies.

Limitations: The findings of this study are limited to a context of the final year Physiotherapy students belonging to a single institute with a small sample size which may affect the generalization of findings. The current study utilized a self-report questionnaire to assess reflective capacity and self-directed learning readiness which was based on student's perceptions and not a direct assessment. Furthermore, this research was conducted cross-sectionally, which makes it difficult to draw conclusions about causality. Longitudinal studies incorporating reflective writing training to check its effectiveness on self-directed learning and clinical competency could be promising.

CONCLUSION

Present study found a significant but weak positive correlation between reflective capacity and self-directed learning indicating that as the reflective capacity score increased, students demonstrated better self-directed learning potential. Since the results of the study showed a weak but significant correlation, self-directed learning can be considered as a predictor of reflective capacity. There was no correlation found with reflective capacity and clinical competency of final year Physiotherapy under-graduate students. Future studies with larger samples are needed to establish strong positive significant relationship between these outcomes.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: The authors would like to whole-heartedly acknowledge and thank the author and owner of SRSSDL and APP tool who granted permission to utilize the questionnaire in this study. Authors would like to express their gratitude to all the students who participated in the study.

Conflict of Interest: None

Source of Funding: None

REFERENCES

1. Sandars J. The use of reflection in medical education: AMEE Guide No. 44. Med Teach. 2009 Aug;31(8):685-95. doi: 10.1080/01421590903050374.
2. Shrivastava SR, Shrivastava PS. Encouraging reflection among medical undergraduate and postgraduate students for advancement of learning and development of skills. J Sci Soc 2021; 48:57-9.
3. Khoshgoftar Z, Barkhordari-Sharifabad M. Medical students' reflective capacity and its role in their critical thinking disposition. BMC Med Educ. 2023 Mar 30;23(1):198. doi: 10.1186/s12909-023-04163-x.
4. Dutta S,He M, Tsang Dan. Reflection and peer assessment to promote self-directed learning in higher education. Journal of Educational Research and Reviews.2023; 11(3): 35-46.doi: 10.33495/jerr_v11i3.23.111.
5. Lee HK, Mori C. Reflective practices and self-directed learning competencies in second language university classes. Asia Pacific Journal of Education.2021; 41(1):130-15. Doi: 10.1080/02188791.2020.1772196.
6. Knowles M. Self-directed learning: A guide for learners and teachers. Toronto, ON: The Adult Education Company; 1975.
7. Tricio J, Woolford M, Escudier M. Dental students' reflective habits: Is there a relation with their academic achievements? Eur J Dent Educ 2015; 19:113-21.
8. Loka SR, Doshi D, Kulkarni S, et al. Effect of reflective thinking on academic performance among undergraduate dental students. J Edu Health Promot 2019; 8:184.
9. Cadorin L, Bressan V. & Palese A. Instruments evaluating the self-directed learning abilities among nursing students and nurses: a systematic review of psychometric

properties. BMC Med Educ.2017; 17(1):229. https://doi.org/10.1186/s12909-017-1072-3.
10. Lu SY,Ren XP, Xu H, et al. Improving self-directed learning ability of medical students using the blended teaching method: a quasi-experimental study. BMC Med Educ.2023; 23:616. Doi: https://doi.org/10.1186/s12909-023-04565-x
11. Slater CE, Cusick A, Louie JCY. Explaining variance in self-directed learning readiness of first year students in health professional programs. BMC Med Educ. 2017 Nov 13;17(1):207.
12. Rascón-Hernán C, Fullana-Noell J, FuentesPumarola C,et al; Measuring selfdirected learning readiness in health science undergraduates: A cross-sectional study. Nurse Educ Today. 2019; 83:104201.
13. Hui T, Zakeri MA, Soltanmoradi Y, et al.Nurses' clinical competency and its correlates: before and during the COVID-19 outbreak. BMC Nurs. 2023 May 7;22(1):156. doi: 10.1186/s12912-023-01330-9.
14. Prakash J, Chatterjee K, Srivastava K, et al;Workplace based assessment: A review of available tools and their relevance. Ind Psychiatry J. 2020 Jul-Dec;29(2):200-204. doi: 10.4103/ipj.ipj_225_20.
15. Dalton M, Davidson M, Keating J. Assessment of Physiotherapy Practice (APP) is a valid measure of professional competence of physiotherapy students: a cross-sectional study with Rasch analysis. J Physiother. 2011;57(4):239–46.
16. Dalton M, Davidson M, Keating JL. The Assessment of Physiotherapy Practice (APP) is a reliable measure of professional competence of physiotherapy students: a reliability study. J Physiother. 2012;58(1):49–56.
17. Kanaga Kumari Chelliah and Zena Arumugam. Does Reflective Practice Enhance Clinical Competency in Medical Imaging Undergraduates? Procedia - Social and Behavioral Sciences .2012;60:73 – 77.
18. van Lankveld W, Maas M, van Wijchen J,et al.Self-regulated learning in physical therapy education: a non-randomized experimental study comparing self-directed and instruction-based learning. BMC Med Educ. 2019 Feb 8;19(1):50. doi: 10.1186/s12909-019-1484-3.
19. Kember D, Leung DY, Jones A, et al. Development of a questionnaire to measure the level of reflective thinking. Assess Eval High Educ 2000; 25: 38195.
20. Williamson SN. Development of a self-rating scale of self-directed learning. Nurse Res. 2007;14(2):66-83.
21. Khalid F, Yassin SFM, Daud MY, et al. Exploring reflective capacity among first-year students on a computer in education course. Creative Education.2016;07(01): 77–85. https://doi.org/10.4236/ce.2016.71008.
22. Patterson C, Crooks D, & Lunyk-Child O. A new perspective on competencies for self-directed learning. Journal of Nursing Education.2002; 41(1): 25–31.
23. Aydoğmuş M, Şentürk C. An investigation into the predictive power of reflective thinking on learning strategies. Reflective Practice. 2023;24(2):210–223. doi:10.1080/14623943.2022.2158796.
24. Winkel AF, Yingling S, Jones AA, et al. Reflection as a learning tool in graduate medical education: A systematic review. J Grad Med Educ 2017; 9:430–9.
25. Shrivastava SB, Mendhe HG. Strengthening Reflection Among Medical Students. Indian Journal of Public Health.2025; 69(1):119-120. doi: 10.4103/ijph.ijph_1372_23.
26. Bryan CS, Babelay AM. Building character: a model for reflective practice. Acad Med. 2009;84(9):1283–8.
27. Almarwani AM, Alzahrani NS. Factors affecting the development of clinical nurses' competency: A systematic review. Nurse Educ Pract. 2023 Nov; 73:103826. doi: 10.1016/j.nepr.2023.103826.
28. Bethune C, Brown JB. Residents' use of case-based reflection exercises. Can Fam Physician. 2007 Mar;53(3):471-6, 470.

How to cite this article: Shruti Prabhakaran Nair, Bhavana Suhas Mhatre, Vrushali Prashant Panhale. Assessment of reflective capacity and its association with self-directed learning and clinical competency in final year physiotherapy students: a cross-sectional study. *Int J Health Sci Res.* 2025; 15(11):103-109. DOI: *https://doi.org/10.52403/ijhsr.20251114*

******