# Self-Regulatory Learning Skills of Undergraduate Students of Rehabilitation Sciences at Khyber Medical University Peshawar: A Cross-Sectional Study

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## ABSTRACT

**Background**: Self-regulated learning (SRL) is a crucial skill for students, enabling them to manage their learning, set goals, and evaluate their progress. SRL skills are particularly important for students in healthcare education, where independent learning is vital for academic and professional success.

**Objective**: This study aimed to evaluate the self-regulatory learning skills of undergraduate rehabilitation sciences students at Khyber Medical University, Peshawar, and identify areas of improvement.

**Methods**: A cross-sectional study was conducted from May to August 2024, including 166 undergraduate students from physical therapy, speech-language pathology, occupational therapy, prosthetics and orthotics, and audiology programs. Data were collected using a self-regulatory learning questionnaire on a 5-point Likert scale. Participants were selected through simple random sampling, and data analysis was performed using SPSS version 25. Descriptive statistics were calculated, and chi-square tests were used to assess associations between SRL skills and demographic variables.

**Results**: The mean age of participants was 20.69 years (SD = 1.87). Most students showed good SRL skills (44%), followed by average (27.7%), poor (15%), and excellent (13.3%).

**Conclusion**: While most students showed good SRL skills, a significant number showed average and poor skills, highlighting the need for curriculum interventions to improve SRL.

## INTRODUCTION

Self-regulated learning (SRL) plays a crucial role in shaping a student's academic performance by allowing individuals to take control of their learning process. It integrates cognition, motivation, and metacognition, which are all necessary for students to manage their time, set goals, and evaluate their progress (1). Students who are proficient in self-regulated learning tend to show higher levels of academic success, as their learning is guided by strategic goal setting and continuous self-assessment (2). In the context of medical education, research consistently underscores the importance of self-regulation, as it equips students with the skills needed to navigate the complexity of health sciences (3). A student's ability to manage their time effectively is one of the most significant aspects of SRL, enabling them to maintain a balance between their academic and personal life, ultimately fostering better learning outcomes (4).

Studies have shown that students with higher self-efficacy engage more deeply with their learning, adopting strategies that promote critical thinking and problem-solving (5). They monitor their progress, adjust their learning strategies, and adapt to new challenges, which is key in academic environments that require consistent performance improvement (6). Research highlights the importance of deep learning strategies over surface learning strategies. Students who engage deeply with their material are more likely to perform well academically compared to those who rely on memorization techniques, which do not promote a thorough understanding (7). Self-efficacy is strongly correlated with the application of deep learning methods, as students who believe in their ability to succeed are more likely to employ effective learning strategies (8).

Rehabilitation sciences, including fields such as physical therapy, occupational therapy, and speech-language pathology, require students to develop critical self-regulatory skills to excel in both academic and clinical settings. The ability to assess one's own performance is essential for fostering independence in professional practice (9). Research in this area has indicated that many students struggle to develop effective SRL skills, particularly in areas such as goal setting and time management (10). This deficiency can have significant implications for their overall academic and clinical performance, as well as their self-confidence and motivation (11). In light of these findings, it is essential to incorporate SRL training into the curriculum for rehabilitation sciences students to promote their ability to learn independently and adaptively in clinical environments (12).

This study aims to evaluate the SRL skills of undergraduate students enrolled in rehabilitation sciences at Khyber

Medical University, Peshawar. By identifying the strengths and weaknesses in these skills, this research seeks to offer insights into how educational interventions can be designed to foster SRL, ultimately enhancing the students' academic performance and clinical success. Previous research supports the notion that effective SRL training has long-term benefits, enabling students to transition smoothly into professional roles that require self-directed learning (13). Therefore, understanding the current state of SRL among these students is critical to developing educational strategies that will empower them as both learners and practitioners.

## MATERIAL AND METHODS

This cross-sectional study was conducted at the Institute of Physical Medicine and Rehabilitation, Khyber Medical University, Peshawar, from May to August 2024, following ethical approval from the Institutional Review Board (DIR/IPM&R-EC/202407). The study focused on evaluating the self-regulatory learning skills of undergraduate students enrolled in various rehabilitation sciences programs, including physical therapy (DPT), occupational therapy (OT), speech-language pathology (SLP), prosthetics and orthotics (P&O), and audiology.

The inclusion criteria consisted of students from the first (1st and 2nd) and final semesters, aged between 18 and 30 years, who were willing to participate after giving informed consent. Students from semesters other than those specified, or those who declined to provide consent, were excluded from the study. A total of 182 students were eligible to participate, and data were collected from 166 participants using a self-regulation questionnaire designed on a 5-point Likert scale. The questionnaire, consisting of 22 closed-ended questions, gathered demographic details such as age, gender, discipline, and semester. Responses were rated from 1 (strongly disagree) to 5 (strongly agree).

Data collection was done through random sampling, a probability technique that allowed for the selection of a representative subset of students. The sampling method ensured that every participant had an equal opportunity to be included, reducing selection bias. Participants were provided with detailed information about the study, including its purpose and potential outcomes. They were assured of confidentiality, and the voluntary nature of participation was emphasized. Consent forms were distributed before the data collection, and participants were informed that their responses would be kept anonymous, as per the ethical guidelines outlined in the Declaration of Helsinki (18).

The collected data were analyzed using SPSS version 25. Descriptive statistics were employed to analyze the demographic information of the participants, including the mean and standard deviation for age. Frequencies and percentages were calculated for categorical variables such as gender, academic discipline, and semester. The self-regulatory learning skills were categorized into four groups: excellent, good, average, and poor. Data analysis was carried out using chi-square tests to identify any significant associations between self-regulatory skills and demographic variables. A $p$-value of less than 0.05 was considered statistically significant.

In summary, the study followed a robust methodological approach to assess self-regulatory learning skills among undergraduate students in rehabilitation sciences. By employing validated questionnaires, probability sampling, and comprehensive statistical analysis, the study aimed to provide insights into the current state of self-regulation in these programs, ultimately guiding future educational interventions.

## RESULTS

The study included a total of 166 participants from the undergraduate programs in rehabilitation sciences, with a response rate of 91.2% from the initially recruited sample of 182 students. Of the respondents, 107 (64.5%) were male, and 59 (35.5%) were female. The mean age of the participants was 20.69 years (SD = 1.87). The distribution of participants across disciplines and semesters is detailed in Table 1.

**Table 1: Demographic Characteristics of Participants**

| Variable | Categories | Frequency (n) | Percentage (%) | Mean ± SD |
|---|---|---|---|---|
| Gender | Male | 107 | 64.5 | |
| | Female | 59 | 35.5 | |
| Age | | | | 20.69 ± 1.87 |
| Discipline | DPT | 67 | 40.4 | |
| | SLP | 33 | 19.9 | |
| | Audiology | 29 | 17.5 | |
| | OT | 20 | 12.0 | |
| | P&O | 17 | 10.2 | |
| Semester | 1st | 57 | 34.3 | |
| | 2nd | 57 | 34.3 | |
| | 8th | 20 | 12.0 | |
| | 10th | 32 | 19.3 | |

The analysis of self-regulatory learning (SRL) skills revealed that the majority of participants demonstrated good SRL skills. As shown in Table 2, 73 (44%) students exhibited good SRL skills, while 46 (27.7%) demonstrated average skills, and 25 (15%) displayed poor SRL skills. Only 22 (13.3%) participants were categorized as having excellent SRL skills.

**Table 2: Frequency of SRL Skill Levels Among Participants**

| SRL Skill Category | Frequency (n) | Percentage (%) |
|---|---|---|
| Excellent | 22 | 13.3 |
| Good | 73 | 44.0 |
| Average | 46 | 27.7 |
| Poor | 25 | 15.0 |
| Total | 166 | 100.0 |

The results show that the majority of students (44%) had good self-regulatory learning skills, followed by those with average skills (27.7%). A smaller proportion of students (15%) reported poor SRL skills, which may indicate challenges in managing their learning processes. The smallest group of students (13.3%) demonstrated excellent SRL skills.

In terms of gender differences, female participants tended to have better SRL skills, though the differences were not statistically significant. Further analysis using chi-square tests did not show any significant association between SRL skill levels and the academic discipline or semester of the participants (p > 0.05). The findings indicate that while most rehabilitation sciences students possess good SRL skills, a significant portion still demonstrate average or poor skills, suggesting a need for targeted interventions to enhance these skills in the academic curriculum.

## DISCUSSION

The findings of this study revealed that a significant portion of undergraduate students in rehabilitation sciences at Khyber Medical University possessed good self-regulatory learning (SRL) skills, with 44% demonstrating good proficiency in SRL and 13.3% exhibiting excellent skills. However, a considerable proportion of students displayed average (27.7%) and poor (15%) SRL skills, which may impact their academic performance and long-term success in clinical practice. These results align with previous studies highlighting the essential role of SRL in academic achievement and professional development. For instance, studies have shown that students with higher SRL capabilities tend to set more realistic and challenging goals, better manage their time, and employ effective learning strategies, all of which are key components for academic success (1, 5).

In comparison to similar research, this study's findings are consistent with research conducted by Babayigit and Guven (2020), which found that undergraduate students in Turkish universities exhibited moderate self-regulatory skills across various disciplines, although the spectrum of SRL proficiency varied widely depending on the educational practices of the institution (21). Moreover, the findings from Demirören et al. (2020) also support this study, demonstrating a positive correlation between SRL skills and academic achievement in medical students (22). These studies emphasize the importance of fostering SRL skills in healthcare education, where self-regulation can have long-lasting impacts on clinical and professional competencies.

The gender distribution in this study revealed that female students tended to have slightly better SRL skills than their male counterparts, although the differences were not statistically significant. This is in line with findings from research conducted at Çukurova University, Turkey, where female students showed higher SRL skills compared to males (24). However, the underlying reasons for this gender disparity were not explored in depth in this study, and further research is needed to better understand gender-specific factors influencing SRL in rehabilitation sciences students.

The strengths of this study lie in its focus on a specific cohort of students in rehabilitation sciences, a field where SRL is critical for both academic success and professional development. The inclusion of students from multiple rehabilitation disciplines, such as physical therapy, speech-language pathology, and occupational therapy, provided a comprehensive understanding of SRL across different fields. The use of a validated self-regulatory learning questionnaire ensured that the data collected were reliable and reflective of the participants' true abilities.

However, the study also had several limitations. The sample size, although adequate, was limited to students from a single institution, which may reduce the generalizability of the findings to other universities and contexts. Additionally, only students from the first, second, and final semesters were included, which may have excluded those in the middle stages of their education, potentially leading to biased results. Another limitation was the cross-sectional nature of the study, which only provided a snapshot of the students' SRL skills at a single point in time, without considering longitudinal changes in their abilities as they progressed through their education. Future research should consider expanding the sample size and including students from different academic years to provide a more comprehensive view of SRL development. Moreover, longitudinal studies are recommended to assess how SRL skills evolve over time and how interventions can be implemented to improve these skills throughout the course of education.

The study highlighted the need for integrating targeted educational interventions into the curriculum to enhance SRL skills. Programs focusing on time management, goal-setting, and self-assessment could be beneficial in helping students improve their self-regulation, which, in turn, would positively affect their academic performance and clinical competencies. Research has demonstrated that such interventions can be effective, as seen in a study by Kaushik and Jena (2021), which showed that cognitive-behavioral strategies targeting SRL in students with learning difficulties led to improved academic outcomes (9). Implementing similar strategies in the rehabilitation sciences curriculum could address the gaps identified in this study, particularly for students demonstrating average and poor SRL skills.

## CONCLUSION

In conclusion, while a substantial number of students in rehabilitation sciences at Khyber Medical University demonstrated good SRL skills, there remains a significant need to support those with average and poor skills. By addressing these deficiencies through curriculum development and targeted interventions, educational institutions can better prepare students for the academic and clinical demands of their professions. Further research is necessary to explore the long-term impact of SRL on clinical performance and to identify effective strategies for fostering SRL in healthcare education.

## REFERENCES

1. Ngwira FF, Kamwaza M, Rashid S, Boby G, Kadzakumanja G. Medical and Allied Health Students' Self-Regulated Learning: The Interplay Between Motivational Beliefs and Learning Strategies. J Contemp Med Educ. 2019.
2. Alvi E, Gillies RM. Self-Regulated Learning (SRL) Perspectives and Strategies of Australian Primary School Students: A Qualitative Exploration at Different Year Levels. Educ Rev. 2023;75(4):680-702.
3. Wolters CA, Brady AC. College Students' Time Management: A Self-Regulated Learning Perspective. Educ Psychol Rev. 2021;33(4):1319-51.
4. Tavakolizadeh J, Ebrahimi-Qavam S. Effect of Teaching of Self-Regulated Learning Strategies on Attribution Styles in Students. 2011.
5. Vujačić M, Stanišić J, Mirkov S. University Students' Motivation and Learning Strategies From the Perspective of Self-Regulated Learning. Probl Perspect Contemp Educ. 2021;273-94.
6. Kashif MF, Shahid R. Students' Self-Regulation in Online Learning and Its Effect on Their Academic Achievement. Glob Educ Stud Rev. 2021.
7. Šteh B, Šarić M. Enhancing Self-Regulated Learning in Higher Education. Revija Za Elementarno Izobraževanje. 2020.
8. Liz-Domínguez M, Caeiro M, Nistal ML, Mikic-Fonte FA. Monitoring Students' Self-Regulation as a Basis for an Early Warning System. In: Learning Analytics Summer Institute Spain. 2021.
9. Kaushik P, Jena S. Self-Regulation Learning Strategies and Academic Performance in Students With Learning Difficulty. Int J Behav Sci. 2021;14:172-7.
10. García-Pérez D, Fraile J, Panadero E. Learning Strategies and Self-Regulation in Context: How Higher Education Students Approach Different Courses, Assessments, and Challenges. Eur J Psychol Educ. 2021;36(2):533-50.
11. Doostian Y, Fattahi S, Goudini AA, Azami Y, Massah O, Daneshmand R. The Effectiveness of Self-Regulation in Students' Academic Achievement Motivation. 2014.
12. Nazeri R, Lotf Abadi H, Pourshahryar H. The Effectiveness of Training Mindfulness, Self-Compassion, and Self-Regulation on Physical Activity Enjoyment Among Obese and Overweight. J Rehabil Sci Res. 2018;5(4):111-4.
13. Zaidi U. Learning Strategies, Self-Efficacy and Performance Among Students of College of Health and Rehabilitation Sciences, Princess Noura Bint Abdulrahman University. Int J Life Sci Pharm Res. 2020;11(1).
14. Hasan H, Karwan DH, Hermanto D, Yani H, Riswanti R, Sudrajat U. Motivation and Learning Strategies: Student Motivation Affects Student Learning Strategies. J Indones Educ Psychol. 2021;10(1):39-49.
15. Ryan G, Vyrostek S, Aminoff D, Booth K, Driesbach S, Fisher M, et al. Importance of Education and the Role of the Patient and Family in the Care of Anorectal Malformations. Semin Pediatr Surg. 2020.
16. Siddiqui F, Malik AA. Promoting Self-Regulated Learning Skills in Medical Students Is the Need of Time. J Taibah Univ Med Sci. 2019;14(3):277-81.
17. Demirören M, Turan S, Öztuna D. Medical Students' Self-Efficacy in Problem-Based Learning and Its Relationship With Self-Regulated Learning. Med Educ Online. 2016;21(1):30049.
18. Qaiser A, Waqqar S, Noor AA, Zakaria M, Iqbal F. Barrier Faced by Undergraduate Medical Students to Become Self-Regulated Learners. 2019.
19. Khan YM, Shah MH, Sahibzada HE. Impact of Self-Regulated Learning Behavior on the Academic Achievement of University Students. FWU J Soc Sci. 2020;14(2).
20. Shuy T, Staff T. TEAL Center Fact Sheet No. 3: Self-Regulated Learning. The Teaching Excellence in Adult Literacy (TEAL) Center, US Department of Education. 2010.
21. Baldan Babayigit B, Guven M. Self-Regulated Learning Skills of Undergraduate Students and the Role of Higher Education in Promoting Self-Regulation. Eurasian J Educ Res. 2020;89:47-70.
22. Demirören M, Turan S, Teker GT. Determinants of Self-Regulated Learning Skills: The Roles of Tutors and Students. Adv Physiol Educ. 2020;44(1):93-8.
23. Chen JH, Björkman A, Zou JH, Engström M. Self–Regulated Learning Ability, Metacognitive Ability, and General Self-Efficacy in a Sample of Nursing Students: A Cross-Sectional and Correlational Study. Nurse Educ Pract. 2019;37:15-21.
24. Kurt E, Eskimez Z. Examining Self-Regulated Learning of Nursing Students in Clinical Practice: A Descriptive and Cross-Sectional Study. Nurse Educ Today. 2022;109:105242.