Self-Efficacy, Self-Regulated Learning, and Motivation as Factors Influencing Academic Achievement Among Paramedical Students

A Correlation Study

Mahnaz Moghadari-Koosha, MSc
Mohammad Moghadasi-Amiri, PhD
Fatemeh Cheraghi, PhD
Hamideh Mozafari, MSc
Behzad Imani, PhD
Mitra Zandieh, MSc

INTRODUCTION: Academic achievement is the most important indicator of the success of students in educational activities, but its nature is complex and multifactorial. The purpose of the present study was to determine self-efficacy, self-regulated learning, and motivation as potential factors influencing academic achievement among paramedical students. **METHODS:** In this correlation study, 400 undergraduate students were selected through a stratified random sampling method. The criterion for academic achievement was the student's grade point average. The data were analyzed using multiple linear regression equation, ANOVA, and independent t-tests. **RESULTS:** The mean score of the self-efficacy, self-regulated learning, and motivation was 62.18±9.3, 76.31±11.3, and 81.83±8.58, respectively. Self-regulated learning, self-efficacy, and motivation together accounted for 19.6% of the variance in academic achievement ($p<0.001$). Self-regulated learning had a direct relationship with academic achievement ($p<0.001$) and was the better predictor of academic achievement ($\beta=0.337$). A significant relationship between self-regulated learning and academic achievement was seen in operating room nursing, radiology sciences, anesthesiology ($p<0.001$), and laboratory sciences ($p<0.01$) students. **CONCLUSIONS:** Self-regulated learning was the better predictor of academic achievement. Self-regulated learning seems to encourage students to believe in their abilities and to be more motivated and self-learning in both classroom and practical settings. *J Allied Health* 2020; 49(3):e145–e152.

M. Moghadari-Koosha is Instructor, School of Paramedicine; **M. Moghadasi-Amiri**, Dep. of Biostatistics, School of Public Health; **F. Cheraghi** is Associate Professor, Chronic Disease (Home Care) Research Center; **H. Mozafari** is Instructor, Dep. of Anesthesiology, School of Paramedicine; **B. Imani** is Assistant Professor, Urology and Nephrology Research Center; and **M. Zandieh** is Instructor, Dep. of Operating Room, School of Paramedicine, Hamadan University of Medical Sciences, Hamadan, Iran.

Address correspondence to: Dr. Fatemeh Cheraghi, School of Paramedicine, Hamadan University of Medial Sciences, Shahid Fahmide Bulv., PO Box 65178, Hamadan, IR Iran. Tel +98-8138232193, fax +98-8138380447. f_cheraghi@umsha.ac.ir.

IN RECENT YEARS, higher education has given special attention to the development of student learning processes.[1] Preparing health science students to transition to professional practice is a challenge due to the rapid and complex changes that occur in the healthcare environment.[2–5] A lack of curriculum that responds to rapidly changing healthcare environments is recognized as one of the main barriers to preparing students for their post-graduation work. The other barriers should be staffing shortages, financial constraints, as well as increasing student numbers.[6] On the other hand, health services need competent and work-ready graduates to meet the needs of their communities and improve practice standards and healthcare outcomes.[6,7] If undergraduate educational preparedness is well done, it will be easier to transition from being a student to a professional person at the workplace. Therefore, the main task of medical and paramedical educators is not only to provide students with knowledge and practical skills, but also to develop students' mental skills and analytical abilities to successfully process information and knowledge.[1,8] This ability is defined as professional competence in medical education.[9] Moreover, health science students should have clinical competence.

Clinical competence is the ability to effectively combine cognitive, affective, and psychomotor skills when providing healthcare or health services in the fields or practice settings.[10] It includes skills of using knowledge, interpersonal communication, problem-solving and technical skills[11] while students acquire the educational experiences of supported learning in practice settings.[7,12] Interprofessional learning and collaborative practice to share knowledge and expertise are other

competencies that graduate students need to work independently in complex healthcare settings.[7]

Identifying students' abilities and factors influencing their professional and clinical competence will help educators enhance students' academic achievement and their capability to meet expectations of post-graduation work settings.[13] It is clear that many personal, educational, and intermediate factors contribute to students' professional and clinical competence and the preparedness of the graduates to face a variety of challenges, as responsibility and accountability, in today's complex healthcare settings.[10] Self-regulated learning (SLR), self-efficacy, and motivation can be mentioned as the most important pre-graduation or intermediate factors affecting academic achievement and gaining competence; however, the nature of this relation is still complex.[1,8,9,14]

SLR has become one of the most important issues in education. SLR is a self-directive and mental knowledge process that empowers students to engage actively in learning by themselves.[15,16] SLR will facilitate learning by training independent students. The use of SLR strategies leads to better learning and more sense of competence in learners.[14] Self-regulated learners determine their learning goals, and then put in effort to supervise and adjust their knowledge, incentive, and behavior,[17] can control their performance before, during and after learning and be aware of their strengths and weaknesses.[15] They evaluate their planning, monitoring and their own progression, having an internal motivation to learn.[18] Therefore, SLR leads to better learning and more sense of competence in learners.[14] In recent years, the concept of SLR has become an important variable in improving academic achievement. Research has shown that learners using SLR strategies are more successful in their academic performance[19–21] and also in clinical settings[22] and became lifelong learners who can control their learning needs and activities.[23,24]

In Bandura's social cognitive theory, self-efficacy influences and adjusts individuals' behavior. Self-efficacy is defined as the belief of a person in their own capability to carry out specified tasks with success.[25] In academic settings, self-efficacy is defined as the student's views of their capability to acquire new competence and mastering in given tasks.[26] Self-efficacy impacts the development of knowledge and abilities needed to act in postgraduate professional practice.[10,24] Most educational studies reported that higher self-efficacy improved students' ability and could be used to predict academic performance, and was a mediator of academic achievement.[20,26–31]

Motivation is of particular interest to educational psychologists because of the critical role it plays in student learning. However, achievement motivation which is studied in the educational settings differs from the motivation studied by psychologists in other fields, in general.[32] Motivation is defined as the incentive that drives a person try hard to reach high levels of achievement and to overcome obstacles.[33] Motivation can affect how a person performs a job and represent a willingness to demonstrate qualification in assigned tasks.[34] High-motivated individuals tend to set higher standard goals that are both feasible and challenging, whereas others tend to adhere to the norms.[35] Achievement motivation plays an important role in academic settings and is one of the most valuable sources of students' efforts in achieving professional competencies[33] and has an important role in learning.[32] Understanding academic motivation helps educators explain why some students perform well while others do not.[36]

Academic achievement and performance is the most important indicator of success in academic settings. Academic achievement is usually measured by grade point average (GPA).[10] Measuring academic achievement reflects individuals' past performance results[37] and presents key information about students' mastery in academic activities and clinical or technical skills.[10,38]

Recognizing the out-of-the-classroom factors that potentially influence academic achievement is an important part of educational research.[38] However, fewer studies have been conducted on the contribution of some intermediate variables, such as students' self-efficacy, SLR, and motivation to academic achievement among paramedical students. Sparsity of knowledge about the factors affecting academic achievement and competence of undergraduate paramedical students may result in their lack of preparedness for what awaits them after graduation. Therefore, the originality of the current study lies in examining the factors potentially influencing academic achievement among paramedical students.

Methods

Design and Setting

The current study was a correlation study that was conducted in 2016–2017 at the Paramedicine School of Hamadan University of Medical Science, Iran. This study was reviewed and approved by the Institutional Review Board (no. 9506233730) and the Research Ethic Board of Hamadan University of Medical Sciences (no. IR.UMSHA.REC.1395.300). Written informed consent was obtained from all participants, and the students' results were anonymously reported to comply with the ethical criteria.

Participants and Procedure

The student population included operating room nursing, anesthesiology, laboratory sciences, radiology sciences, and medical information technology students. An inclusion criterion was that the students had passed the two first semesters successfully to have sufficient knowledge about their educational fields. The exclusion criteria were a positive history of a psychiatric disorder

MOGHADARI-KOOSHA ET AL., Factors Influencing Academic Achievement

based on documentation in educational files and incomplete questionnaires. Participants were selected from paramedical students in their third to eighth semesters by a stratified random sampling method. First, a list of the undergraduate students based on the field of study was prepared. Then, participants were randomly selected from the list according to the number of students in each field. Sample size was 446 students (α=0.05, β=0.1, r=0.2). Only 400 questionnaires were completed and returned by the respondents (response rate 89.69%).

Data were gathered between September to December in 2016. Data were collected through self-report questionnaires. After the written informed consent was obtained from participants, the questionnaires were distributed. Approximately 30 minutes was used to complete the questionnaires.

Data Collection

Data collection tools were demographic information; general self-efficacy; SRL; and achievement motivation questionnaires.

Demographic information questionnaire: It comprised basic information regarding gender, age, field of study, employment status, marital status, habitat, semesters of education, and GPAs of the last semesters. GPA, as the criterion for assessing the student's academic achievement status, was determined according to the official educational performance reports.

General self-efficacy scale: Sherer et al. developed the general self-efficacy scale. The self-efficacy scale measures the level of a person's confidence in special activities[39] and is based on Bandura's social cognitive theory.[40] It includes 17 items reported on a 5-point Likert scale, from 1 (not at all true) to 5 (exactly true). The range of scores is 17 to 85. Scores above average indicate high self-efficacy and below average indicate low self-efficacy.[8] Cronbach's alpha in a study was between 0.70 and 0.91.[41] In another study, Cronbach's alpha was 0.86 and the Spearman-Brown coefficient was 0.83,[42] showing the appropriate internal consistency and test-retest reliability of the scale. In the present study, Cronbach's alpha was 0.84.

SRL questionnaire: The SRL questionnaire is a part of the "Motivational Strategies for Learning" questionnaire (MSLQ) developed by Pintrich and De Groot. The SRL part consists of 22 statements on a 5-point Likert scale ranging from 1 (not at all true of me) to 5 (very true of me).[43] The range of scores is 22 to 110. Scores above average indicate more use and below average represent less use of SRL strategies.[44] In a study, Cronbach's alpha was 0.72.[45] In the present study, Cronbach's alpha reliability was 0.74.

Achievement motivation questionnaire: Developed by Hermans,[46] it has 29 incomplete sentences with each item followed by 3 or 4 options ranging from "I com-

TABLE 1. Participants' Demographic Characteristics (*n*=400)

	Frequency	%	Mean±SD	Maximum/Minimum
Age			21.13±1.50	34/18
Grade point average			15.92±1.36	19.73/12
Sex				
Male	276	69		
Female	124	31		
Employment status				
Employed	9	2.25		
Unemployed	349	87.25		
Part-time work as student	42	10.5		
Marital status				
Married	358	89.5		
Unmarried	42	10.5		
Semester				
Third	165	41.25		
Fifth	112	28		
Eighth	123	30.75		
Field of study				
Operating room nursing	113	28.25		
Radiology sciences	112	28		
Medical information technology	27	6.75		
Laboratory sciences	67	16.75		
Anesthesiology	81	20.25		
Habitat				
Native	171	42.75		
Non-native	205	51.25		
No answer	24	6		

pletely agree" to "I totally disagree." The range of scores is 29 to 116. Scores above average indicate high achievement motivation and lower than average represent low achievement motivation in participant students. Hermans reported the suitable concurrent and content validity of the achievement motivation questionnaire.[46] Cronbach's alpha of 0.84 and the test-retest reliability coefficient of 0.84, with 3-week interval, indicated the suitable reliability of the Iranian version of the questionnaire.[47] In the present study, Cronbach's alpha reliability was 0.82.

Data Analysis

Data were analyzed by SPSS 20 software. Multiple linear regression analysis was used to examine the impact of independent variables and demographic characteristics on the academic achievement variable. Analysis of variance (ANOVA) and independent *t*-tests were used to compare participant students based on the independent variables and demographic characteristics.

Results

The majority of students were female (69%) with mean age of 21.13±1.50 years, single (89.5%), unemployed (87.3%), non-native (51.25%), studying in their third semester (41.25%), and being operating room nursing

TABLE 2. Multiple Regression Analysis of Relationship Between Independent Variable and Students' Academic Achievement (Grade Point Average)

Variable	B	SE	β	t	p	95% CI
Constant	13.919	.770		18.071	.000	12.403–.038
Self-efficacy	.018	.010	.126	1.723	.086	.024–.023
Self-regulated learning	.40	.008	.337	5.146*	.000	15.435–.003
Achievement motivation	.000	.012	.003	.034	.973	.055–.024

* $p<0.001$; $R=0.311$, $R^2=0.097$, $R^2_{adj}=0.087$, SE=1.3142, $F(3,281)=9.91$, $p<0.001$.

students (28.25%). The GPA of students in the last semester was 15.92±1.36 (Table 1). The mean score of the self-efficacy, SRL, and motivation of students was 62.18±9.3, 76.31±11.3, and 81.83±8.58, respectively.

According to the results of multiple regression equation, only a positive and direct relationship was obtained between SRL and academic achievement ($p<0.001$). Increasing each unit to the mean SRL score could add approximately 0.4 to the overall GPA. Self-efficacy, SRL, and motivation together could predict 19.6% of variations in academic achievement ($R^2=0.196$, $p<0.001$). According to beta coefficient, the weight of SRL and self-efficacy in contribution to counting this variance was approximately 0.34 and 0.13, respectively. Therefore, SRL was the better predictor of academic achievement than the other independent variables (Table 2). The result of multiple regressions did not show any significant relationship between academic achievement and demographic characteristics of the participant students.

According to the results of multiple regression equation, there was a significant relationship between SRL and academic achievement in operating room nursing, radiology sciences ($p<0.001$), anesthesiology ($p<0.001$), and laboratory sciences ($p<0.01$) students (Table 3). Regarding the result of ANOVA and independent t-

tests, there was no significant difference between the mean scores of self-efficacy, SRL, motivation and academic achievement of students based on demographic characteristics of the participants.

Discussion

In this correlation study, we applied multiple regression equations to investigate the impact of independent variables on academic achievement. Overall, the SRL was the only factor associated with the academic achievement of respondents, especially, in operating room nursing, radiology, laboratory sciences, and anesthesiology students. Moreover, SRL was the better predictor of academic achievement than self-efficacy and motivation. In other words, use of SRL strategies improved the students' academic achievement.

The finding of the present study was in line with the similar existing literature[1,36,44,48–53] but different from the Brown et al. study (2016) which did not show any correlation between SRL and academic achievement.[54] Usher and Pajares stated that the learners' beliefs about using SRL strategies affected their academic achievement.[49] However, similar existing literature had shown the relationship between self-efficacy, motivation, and SRL on participants' academic accomplishment.[14,55,56]

TABLE 3. Multiple Regression Analysis of Relationship Between Independent Variable and Students' Academic Achievement Based on Fields of Study

Field	Variable	B	SE	β	t	p	95% CI
Operating room nursing	Self-efficacy	.009	.024	.057	.376	.708	.058–040
	Self-regulated learning	.056	.018	.479	3.059*	.003	.019–.023
	Achievement motivation	.016	.024	.102	.669	.506	.063–.031
Radiology sciences	Self-efficacy	.010	.020	.066	.497	.621	.049–.015
	Self-regulated learning	.041	.013	.327	3.112*	.002	.049–.030
	Achievement motivation	.005	.022	.030	.216	.830	.068–.039
Medical information technology	Self-efficacy	.030	.041	.227	.736	.475	.119–.058
	Self-regulated learning	.000	.025	.003	.009	.993	.055–.054
	Achievement motivation	.014	.061	.080	.224	.826	.119–.146
Laboratory sciences	Self-efficacy	.009	.019	.079	.484	.631	.046–.028
	Self-regulated learning	.043	.018	.373	2.406**	.010	.007–.078
	Achievement motivation	.011	.023	.079	.492	.625	.035–.057
Anesthesiology	Self-efficacy	.076	.037	.395	2.045	.057	.151–.001
	Self-regulated learning	.090	.023	.640	3.992**	.000	.045–.136
	Achievement motivation	.023	.031	.136	.760	.451	.038–.085

* Significant at $p<0.01$; ** significant at $p<0.001$.

MOGHADARI-KOOSHA ET AL., Factors Influencing Academic Achievement

In present study, the weight of SRL strategies in contribution to counting the changes in academic achievement variance was approximately 0.34, and increasing each unit to the mean score of SRL could add approximately 0.4 to the GPA. In other words, SRL was the better predictor of academic achievement than self-efficacy and achievement motivation.

This finding was similar to the existing literature on the students' academic achievement.[51,57] However, in Altun and Erden study (2013),[44] SRL, after self-efficacy, was the second variable to predict students' mathematics achievement. The authors concluded that it is related to the content of mathematics courses that it is difficult to learn a new subject without mastering the previous ones.[44] Some potential reasons for our different findings were that our sample size was sufficiently large and the participants included subjects with various fields of study. Another potential explanation could be the fact that paramedical students, like other health sciences students, were expected to progressively gain required general practical or clinical abilities, e.g., advocacy and education to patients and caregivers,[58] skills of using knowledge in practice, interpersonal communication, clinical problem-solving,[11] clinical decision-making,[51,59] and specific competency for performing special and professional tasks independently in practice settings, such as technical skills.[7,11] In a similar study, the SLR strategies could help participant students acquire further success in practice learning.[9,13,23,48,52]

In the present study, similar to Choi[60] and Karamzadeh et al.'s[61] studies, there was no relationship between self-efficacy and academic achievement. However, in other studies, this relationship was direct[20,26,29–31,62–64] and self-efficacy was the best predictor of academic achievement.[20,30,47,63] Laschinger and Tresolini reported that self-efficacy of nursing students was higher than medical students.[65] Besides, successful performance of a new skill improves students' self-efficacy.[66] Some of the possible reason for our different finding may be that our sample included subjects from various academic backgrounds with different educational contents and expectations.

In the current study and similar studies, there were not relationship between motivation and academic achievement.[45,49,67] But another study showed that academic motivation was significantly effective in academic achievement of medical students in pre-clinical as well as clinical levels.[35] According to Ryan and Deci, motivation has been linked with better learning as well as the feeling of competence.[68] There is no clear reason for this different finding from the current research, because motivation plays an important role in improving performance. Perhaps a reason for this different result could be attributed to the students' inaccurate reports. Another reason may be related to the impact of some other factors, such as existing difference between the educational facilities and characteristics of the universities in the countries of studies,[69] race and religion of students.[70] It seems that further investigation is needed to find the compound factors in this regard.

In the current study, a direct relationship was obtained between SLR and academic achievement in operating room nursing, radiology, anesthesiology, and laboratory sciences students. On the other hand, self-efficacy, SLR, and motivation did not differ between students of different fields of study. Laschinger and Tresolini reported that self-efficacy of nursing students was higher than medical students.[65] Usher and Pajares stated that the elementary school students had higher SLR than students in middle and high school.[49]

In regard to demographic characteristics, our study did not find any relationship between academic achievement and demographic characteristics and/or difference between the self-efficacy, SRL, motivation and academic achievement based on the participants' demographic characteristics. Turan et al. (2009), similar to our study, found no significant differences between SRL mean scores of medical students according to gender.[71] In contrast to our study, Javadi and Faryabi's study showed that motivation was greater in female than in male students of medical sciences, and also was higher in the first-year than higher-level students.[72] The other study reported that academic achievement was lower in male, married, non-native medical sciences students.[73] Another study showed that the factors associated with changes in SRL during the transition to clinical learning in the first clinical year were gender and the first clinical experience in medical students.[23] Maybe one reason for these different outcomes could be related to our participants who had been selected from various fields of study.

In higher education, academic achievement is one of the most important indicators of the students' success in educational activities.[17] According to the present study and other similar studies, SLR plays an important role in successfully applying knowledge and in acquiring professional and clinical competence. It seems that paramedical students are conscious about effectiveness of SRL in learning process, as well as in practice in which they should independently handle a large workload. It is recommended that the SLR is considered in educational programs to achieve the mission of higher education.

Limitations

Our study had several limitations. The study was conducted in one Paramedical School, and therefore the interpretation and generalization of our findings require more attention. Another limitation was that our study focused on self-reported questionnaires as data collection tools; therefore, the results relied on students' opinions about themselves. However, the questionnaires have reasonable psychometric properties and our large

sample of students from different fields of study was a strong point of the present study. However, different educational backgrounds and expectations in classroom and practice may affect on the results of our study.

Conclusion

Our study found that SRL was the better predictor of academic achievement of paramedical students than self-efficacy and motivation. Using SLR strategies should improve academic achievement. In other words, SLR could make students more competent and self-directed learners in their fields of study in both classroom and practical settings. Our results showed that further investigation is still needed in this line of work to verify our results and confirm the influences of potential factors on students' academic achievement and competence. Future studies could explore how SRL strategies develop students' clinical competence as well as the role of individual differences of students (e.g., gender, age, marital status, habitat, etc.) in academic achievement.

References

1. Alotaibi K, Tohmaz R, Jabak O. The relationship between self-regulated learning and academic achievement for a sample of community college students at King Saud University. *Educ J* 2017; 6(1):28–37. https://doi.org/10.11648/j.edu.20170601.14.

2. Kim EY, Yeo JH. Effects of pre-graduation characteristics and working environments on transition shock of newly graduated nurses: a longitudinal study. *Nurse Educ Today* 2019; 78:32–36. https://doi.org/10.1016/j.nedt.2019.04.002.

3. Teagle AR, George M, Gainsborough N, Haq I, Okorie M. Preparing medical students for clinical practice: easing the transition. *Perspect Med Educ* 2017; 6:277–280. https://doi.org/10.1007/s40037-017-0352-2

4. Duchscher JEB. Transition shock: the initial stage of role adaptation for newly graduated registered nurses. *J Adv Nurs* 2009; 65(5):1103–1113. https://doi.org/10.1111/j.1365-2648.2008.04898.x.

5. Harvey A, Kamvounias P. Bridging the implementation gap: a teacher as learner approach to teaching and learning policy. *High Educ Res Dev* 2008; 27(1):31–41. https://doi.org/10.1080/07294360701658716.

6. Rodger S, Webb G, Devitt L, et al. Clinical education and practice placements in the allied health professions: an international perspective. *J Allied Health* 2008; 37(1):53–62.

7. Jones D, McAllister L, Lyle D. Stepping out of the shadows: allied health student and academic perceptions of the impact of a service-learning experience on student's work readiness and employability. *J Teach Learn Grad Employability* 2015; 6(1):66–87.

8. Cheragh F, Hassani P, Yaghmaei F, Alavy-Majed H. Developing a valid and reliable self-efficacy in clinical performance scale. *Int Nurs Rev* 2009; 56:214–221. https://doi.org/10.1111/j.1466-7657.2008.00685.x.

9. Opacic DA. The relationship between self- efficacy and student physician assistant clinical performance. *J Allied Health* 2003; 32:158–66.

10. Hakimzadeh R, Ghodrati A, Karamdost N, et al. Factors affecting the teaching-learning in nursing education. *GSE J Educ* 2013; 1:174–184.

11. Reid FC. Baccalaureate education and professional practice. *Nurse Outlook* 2000; 15(3):50–59.

12. Doubt L, Paterson M, O'Riordan A. Clinical education in private practice: an interdisciplinary project. *J Allied Health* 2004; 33:47–50.

13. Oshvandi K, Sadeghi-Moghadam A, Khatiban M, et al. On the application of novice to expert theory in nursing; a systematic review. *JCHPS* 2016; 9 (4): 3014–3020.

14. Yusuf M. The impact of self-efficacy, achievement motivation, and self-regulated learning strategies on students' academic achievement. *Proc Soc Behav Sci* 2011; 15: 2623–2626. https://doi.org/10.1016/j.sbspro.2011.04.158.

15. Dent AL, Koenka AC. The relation between self-regulated learning and academic achievement across childhood and adolescence: a meta-analysis. *Educ Psychol Rev* 2015; 27(3): 41–50. https://doi.org/10.1007/s10648-015-9320-8.

16. Zimmerman BJ. Becoming a self-regulated learner: an overview. *Theory Pract* 2002; 41(2): 64–72. https://doi.org/10.1207/s15430421tip4102_2

17. Pintrich PR. Multiple goals, multiple pathways: the role of goal orientation in learning and achievement. *J Educ Psychol* 2000; 92: 544–555.

18. Zimmerman B. Self- regulation involves more than metacognitions: a social cognitive perspective. *Educ Psychol* 1995; 30 (4): 217– 221. https://doi.org/10.1207/s15326985ep3004_8.

19. Peng C. Self-regulated learning behavior of college students of science and their academic achievement. *Phys Proc* 2012; 33: 1446–1450. https://doi.org/10.1016/j.phpro.2012.05.236.

20. Diseth A. Self-efficacy, goal orientations and learning strategies as mediators between preceding and subsequent academic achievement. *J Learn Individ* 2011; 21(2):191–5. https://doi.org/10.1016/j.lindif.2011.01.003.

21. Sobral DT. An appraisal of medical students' reflection-in-learning. *Med Educ* 2000; 34(3):182–7.

22. Cleary TJ, Sandars J. Assessing self-regulatory processes during clinical skill performance: a pilot study. *Med Teach* 2011; 33(7): 368–374.

23. Cho KK, Marjadi B, Langendyk V, Hu W. Medical student changes in self-regulated learning during the transition to the clinical environment. *BMC Med Educ* 2017; 17(1):59–66. https://doi.org/10.1186/s12909-017-0902-7.

24. Brydges R, Butler D. A reflective analysis of medical education research on self-regulation in learning and practice. *Med Educ* 2012; 46(1):71–79. https://doi.org/10.1111/j.1365-2923.2011.04100.x.

25. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory.* Englewood Cliffs, NJ: Co.; 1986.

26. Pajares F, Miller MD. Mathematics self-efficacy and mathematics performances: the need for specificity of assessment. *J Couns Psychol* 1995; 42:190–198. http://doi.org/10.1037/0022-0167.

42.2.190.

27. Schunk DH, Pajares F. The development of academic self-effi-cacy (pp 15-31). In Wigfield A, Eccles JS, eds. *Development of Achievement Motivation*. San Diego, CA: Academic Press; 2002.

28. Liem AD, Lau S, Nie Y. The role of self-efficacy, task value, and achievement goals in predicting learning strategies, task disen-gagement, peer relationship, and achievement outcome. *Contemp Educ Psychol* 2008; 33:486–512. https://doi.org/10.1016/j.cedpsych.2007.08.001.

29. Middleton M, Midgley C. Avoiding the demonstration of lack of ability: an underexplored aspect of goal theory. *J Educ Psychol* 2007; 89:710–8.

30. Komarraju M, Nadler D. Self-efficacy and academic achieve-ment: Why do implicit beliefs, goals, and effort regulation matter. *J Learn Individ Differ* 2013; 25:67–72. https://doi.org/10.1016/j.lindif.2013.01.005.

31. Cheraghi F, Hassani P, Riazi H. Correlation Between self-efficacy and clinical performance of nursing students. *Sci J Hamdan Nurs Midwifery Fac* 2011; 19(1):35–40.

32. Tohidi H, Jabbari MM. The effects of motivation in education. *Proc Soc Behav Sci* 2012; 31:820–824. https://doi.org/10.1016/j.sbspro.2011.12.148.

33. McClelland DC, Atkinson JW, Clark RA, et al. *The Achievement Motive*. New York: Appleton-Century Crofts; 1953.

34. Harackiewicz JM, Barron KE, Carter SM, et al. Predictors and consequences of achievement goals in the college classroom: maintaining interest and making the grade. *J Pers Soc Psychol* 1997; 73:1284–1295. https://doi.org/10.1037/0022-3514.73.6.1284.

35. Khamoushi F, Parsa Moghaddam A, Sadeghi M, et al. Achieve-ment motivation and academic motivation among students of Kermanshah University of Medical Sciences. *Educ Res Med Sci* 2014; 3(2):55–59.

36. Stegers-Jager KM, Cohen-Schotanus J, Themmen AP. Motiva-tion, learning strategies, participation and medical school per-formance. *Med Educ* 2012; 46(7):678–88.

37. Lent RW, Brown SD. Social cognitive approach to career devel-opment: an overview. *Career Dev Q* 1996; 44(4):310–321. https://doi.org/10.1002/j.2161-0045.1996.tb00448.x

38. Kassarnig V, Mones E, Bjerre-Nielsen A, et al. Academic per-formance and behavioral patterns. *EPJ Data Sci* 2018; 7(10):2–16. https://doi.org/10.1140/epjds/s13688-018-0138-8.

39. Sherer M, Maddux JE. The self-efficacy scale: construction and validation. *Psychol Rep* 1982; 51:663–671.

40. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev* 1977; 84(2):191–215.

41. Scherbaum C, Cohen-Charash Y, Michael C, et al. Measuring general self-efficacy: a comparison of three measures using item response theory. *Educ Psychol Meas* 2006; 66(6):1047–1063. https://doi.org/10.1177/0013164406288171.

42. Najafi M, Foladjang M. Relationship between self–efficacy and mental health in secondary school students. *Daneshvar Raftar J Shahed Univ* 2007; 14(22):69–81.

43. Pintrich PR, De-Groot EV. Motivational and self-regulated learning components of classroom academic performance. *J Educ Psychol* 1990; 82(1):33–40.

44. Altun S, Erden M. Self-regulation based learning strategies and self-efficacy perceptions as predictors of male and female stu-dents' mathematics achievement. *Proc Soc Behav Sci* 2013; 106:2354–64. https://doi.org/10.1016/j.sbspro.2013.12.270.

45. Talebinzhad MR, Negari GM. The effect of explicit teaching of concept mapping in expository writing on EFL students self-reg-ulation. *Linguistic J* 2007; 2(1):69–90.

46. Hermans HJ. A questionnaire measure of achievement motiva-tion. *J Appl Psychol* 1970; 54(4):353–63.

47. Soleimanifar O, Shabani F. The relation of self-efficacy and achievement motivation with academic adjustment of first year undergraduate students of Shahid Chamran University. *J Educ Psychol* 2014; 10(17):83–104. https://doi.org/10.22111/JEPS.2013.1448.

48. De la Fuente J, Zapata L, Martinez-Vicente JM, et al. The role of personal self-regulation and regulatory teaching to predict moti-vational-affective variables, achievement, and satisfaction: a structural model. *Front Psychol* 2015; 6:1–16. https://doi.org/10.3389/fpsyg.2015.00399.

49. Usher EL, Pajares F. Self-efficacy for self-regulated learning: a validation study. *Educ Psychol Meas* 2007; 68(3):443–63. https://doi.org/10.1177/0013164407308475.

50. Sivandani A, Ebrahimi Koohbanani S, Vahidi T. The relation between social support and self-efficacy with academic achieve-ment and school satisfaction among female junior high school students in Birjand. *Proc Soc Behav Sci* 2013; 84:668–73. https://doi.org/10.1016/j.sbspro.2013.06.623

51. Bakhshi M, Ahanchian M-R. A proposed model to predict aca-demic achievement: the role of critical thinking and self-regu-lated learning strategies. *Iran J Med Educ* 2013; 13(2):153–63.

52. Moghadri-Koosha M, Cheraghi F, Mozafari H, et al. Relation-ships between self-regulated learning and academic success among students of paramedicine faculty of Hamedan University of Medical Sciences. *Educ Strategy Med Sci* 2018; 11(3):45–52. https://doi.org/10.29252/edcbmj.11.03.06.

53. Eegeni B, Kanadli S. The effect of self-regulated learning strate-gies on academic achievement: a meta-analysis study. *EJER* 2017; 69:55–74. http://doi.org/10.14689/ejer.2017.69.4.

54. Brown GL, Peterson ER, Yao ES. Student conceptions of feed-back: impact on self-regulation, self-efficacy and academic achievement. *Br J Educ Psychol* 2016; 86(4):606–29. https://doi.org/10.1111/bjep.12126.

55. Elias H, Mahyuddin R, Noordi N, et al. Self-efficacy beliefs of at-risk students in Malaysian secondary schools. *Int J Learn* 2009; 16(4):201–210.

56. Young-Ju J, Mini B, Ha-Jeen C. Self-efficacy for self-regulated learning, academic self-efficacy, and internets self-efficacy in web-based. *Educ Technol Res Dev* 2000; 48(2):5–17.

57. Mohamadi E, Bana-Derakshan H, Borhani F, et al. Relationship between nursing students' achievement motivation and self-effi-cacy of clinical performance. *IJN* 2014; 27(90-91):33–43.

58. Rahimi A, Ahmadpanah M, Shamsaei F, et al. Effect of adju-vant sleep hygiene psychoeducation and lorazepam on depres-sion and sleep quality in patients with major depressive disor-ders: Results from a randomized three-arm intervention. *Neuropsychiatr Dis Treat* 2016; 12(22):1507–15. https://doi.org/10.2147/NDT.S110978.

59. Jahanpour F, Sharif F, Salsali M, et al. Clinical decision-making in senior nursing students in Iran. *Int J Nurs Pract* 2010; 16(6):595–602. https://doi.org/10.1111/j.1440-172X.2010.01886.x.

60. Choi N. Self-efficacy and self-concept as predictors of college stu-dents academic performance. *Psychol Sch* 2005; 42(2):197–205. https://doi.org/10.1002/pits.20048.

61. Karamzadeh MS, Hejazi E, Khanzadeh A, Hejazi B. The role of math self-efficacy, goal orientations and math anxiety on math performance of high school students in Tehran. *JPA* 2011; 4(2):187–212.

62. Sepehrian Azar F, Mahmoudi L. Relationship between mathe-matics, self-efficacy and students' performance in statistics: the meditational role of attitude toward mathematics and mathe-matics anxiety. *J Educ Psychol* 2014; 4(1):32–42.

63. Broadbent J. Academic success is about self-efficacy rather than frequency of use of the learning management system. *Australas J Educ Technol* 2016; 32(4):38–49.

64. Lee W, Lee M, Bong M. Testing interest and self-efficacy as pre-dictors of academic self-regulation and achievement. *Contemp Educ Psychol* 2014; 39(2):86–99. https://doi.org/10.1016/j.cedpsych.2014.02.002

65. Laschinger HKS, Tresolini CP. An exploratory study of nursing and medical students' health promotion counselling self-efficacy. *Nurse Educ Today* 1999; 19(5):408–18. https://doi.org/10.1054/nedt.1999.0326.

66. Caprara GV, Vecchione M, Alessandri G, et al. The contribution of personality traits and self-efficacy beliefs to academic achievement: a longitudinal study. *Br J Educ Psychol* 2011; 81(1):78–96. https://doi.org/10.1348/2044-8279.002004.

67. Othman N, Leng K. The relationship between self-concept, intrinsic motivation, self-determination and academic achievement among Chinese primary school students. *IJPS* 2011; 3(1):90–8. https://doi.org/10.5539/ijps.v3n1p90.

68. Ryan RM, Deci EL. Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemp Educ Psychol* 2000; 25(1):54–67. https://doi.org/10.1006/ceps.1999.1020.

69. Hauer J, Quill T. Educational needs assessment, development of learning objectives, and choosing a teaching approach. *J Palliat Med* 2011; 14(4):503–508. https://doi.org/10.1089/jpm.2010.0232.

70. Butler-Barnes S, Williams T, Chavous T. Racial pride and religiosity among african american boys: implications for academic motivation and achievement. *J Youth Adolesc* 2012; 41(4):486–98. https://doi.org/10.1007/s10964-011-9675-1.

71. Turan S, Demirel Ö, Sayek İ. Metacognitive awareness and self-regulated learning skills of medical students in different medical curricula. *Med Teach* 2009; 31(10):e477–e483. https://doi.org/10.3109/01421590903193521.

72. Javadi A, Faryabi R. Relationship between motivation and academic performance in students at Birjand University of Medical Sciences. *Educ Strategy Med Sci.* 2016; 9(2):142–9.

73. Changizi-Ashtiyani S, Shamsi M. Assessment of influencing factors on educational decline and presenting suitable solutions from the students viewpoints of Arak University of Medical Sciences. *RME* 2010; 2(1):24–34.