

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_1321_20

The effect of peer mentoring on motivation and self-regulated learning in medical students during transition

Soroush Najafinejad¹, Soroor Tabatabaei¹, Nastaran Maghbouli^{1,2,3},
Negar Sadat Ahmadi^{1,3,4}

¹Mentoring Office, Deputy of Education, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran, ²Department of Physical Medicine and Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran, ³School of Public Health, Tehran University of Medical Sciences, Tehran, Iran, ⁴Department of Medical Education, Virtual School, Tehran University of Medical Sciences, Tehran, Iran

Address for correspondence:

Dr. Negar Sadat Ahmadi, Mentoring Office, Deputy of Education, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. School of Public Health, Tehran University of Medical Sciences, Tehran, Iran. Department of Medical Education, Virtual School, Tehran University of Medical Sciences, Tehran, Iran. E-mail: negar.ahmadi2011@yahoo.com

Received: 03-10-2020
Accepted: 22-01-2021
Published: 29-10-2021

Abstract:

BACKGROUND: Self-regulated learning (SRL) is a critical skill for medical students to reach their learning goals in the bedside clinical rotations. This study was performed with the aim of comparing SRL and motivation of 4th year medical students who are in their educational transition between students with mentors and those without mentors.

MATERIALS AND METHODS: This study was cross-sectional. A total of 196 medical students were invited to complete a form consisting the motivation and SRL questionnaire through Google form during their 1st year of clinical clerkship, while some of them had participated in the mentoring program beforehand. data correlation and regression analysis were employed.

RESULTS: Comparing SRL and motivational beliefs scores between students with mentors and without mentors indicated that motivational beliefs mean score in students with mentors (87.5 ± 8.44) was significantly higher compared to the others (83.49 ± 7.36) ($P = 0.005$). Among SRL subscales, planning and examination stress were significantly different between two groups with higher scores for mentees ($P = 0.033$ and 0.021). Having a mentor predicted motivational beliefs with $OR = 7.974$ ($1.391-45.719$) and $P = 0.020$.

CONCLUSION: Considering a significant correlation between mentor possession and the scale of motivation beliefs, future longitudinal and interventional research besides the customized mentoring program is required to understand the role of mentoring programs on SRL as a cause-and-effect relationship to recommend the peer mentoring program to enhance SRL skills in the medical students especially during their transition to the new clinical environment.

Keywords:

Learning, medical education, mentoring, motivation

Introduction

The transition from preclinical learning to clinical rotations is a unique phase with a significant change in a medical students' education when students shift from classroom to bedside learning.^[1,2] Besides adjusting to a new clinical environment with a heavier workload and more working hours, students face stressors, including different expectations of teachers, different teaching styles, uncertainty about their role in patient management and burden of more

self-directed learning.^[1,3,4] They should be capable of defining their learning needs, setting their educational goals and finding appropriate educational programs.^[5,6]

To recapitulate, they should be self-regulated learners which consist of being proactive motivationally, metacognitively, and behaviorally for their learning.^[7] It has also been shown that self-regulated learning (SRL) is positively associated with academic performance emphasizing SRL importance.^[8] According to previous literature, self-regulated learners are

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Najafinejad S, Tabatabaei S, Maghbouli N, Ahmadi NS. The effect of peer mentoring on motivation and self-regulated learning in medical students during transition. *J Edu Health Promot* 2021;10:367.

individuals who can plan their study program, monitor their progression, reflect on their performance and change their path along with new situations.^[9,10] Some other recent studies also claimed that motivation is an inseparable part of SRL.^[11,12] Other components, including effort and self-efficacy, have been introduced to guarantee persons to complete the educational tasks.^[13,14] Unfortunately, SRL skills are not always improved during clinical environment education.^[15] Consequently, the importance of SRL and a supportive system for improving this skill seems to be of great significance in their situation.

A meta-analysis of studies in 2015 confirmed that supervised interventions for SRL yielded better posttest outcomes in comparison with unsupervised ones.^[16] Considering the importance of mentoring programs in a transition time, they can take action by supporting students and transforming and supervising SRL skills and filling the gaps sensed by medical students.^[17-19] Studies have also proved that medical students who tend to seek help in their learning environment are shown to develop better SRL.^[8,20,21] These analyses suggest a supervision program as peer mentoring might help medical students during their transition to clinical courses.

Although the role of teachers as mentors were evaluated among elementary and higher school students, as we investigated, we confronted a lack of studies focusing on medical students in this field.^[17,18]

To the best of our knowledge, this study evaluated SRL among Iranian medical students for the first time. Especially, we focused on assessing this skill during the transition period of students from basic sciences toward the clinical wards, since they are more in need for SRL skills. Furthermore, we assumed to compare SRL between students with mentors and those without mentor. This comparison makes theoretical basis for more future studies and educational interventions to improve SRL.

Materials and Methods

A cross-sectional study was implemented at the Tehran University of Medical Sciences from May to June 2019. The questionnaire was prepared as a Google form. All the 4th year students who experienced at least 2–3 months clinical education received an invitation E-mail after the end of the mentoring program, consisting of the form link and two reminders the next day and again after three days. In total, 196 students (total number of 4th year medical students) were programmed to participate, of whom 136 completed the questionnaire (response rate of 70%).

Stratified sampling method was used to cause similarity between sample and the total medical school student population.

Students were informed about the use of their data for this study and the purpose of the study with a clear explanation in the first part of the questionnaire so it could be filled voluntarily. Ethical Committee of TUMS (No. IR. TUMS. VCR. REC.1399.3261) approved the protocol of this study. Informed consent was written in the top of form in addition to the aim of study.

TUMS mentoring program for 4th-year medical students entering clinical clerkship is running from 2 years ago (from 2018). The mentoring program lasts for 4 months each semester. The program is formal, in peer mentoring manner, and participation is voluntary for both mentors and mentees. Mentors are 5th and 6th-year medical students who are selected after evaluation by some criteria like their educational status. The mentors are trained by workshops at the initial of the program for 4 h in which the basic principles of mentoring is taught. Afterward and in the process of the program, additional reflection sessions are held which the occasional and related issues of mentees discussed anonymously, and faculties or more experienced mentors teach further training.

Data collection tools

Data on demographic information and mentoring possession was self-declared in the first part of the form. In the second part, the motivation and self-regulated learning questionnaire (MSLQ) was used to investigate the students' level of motivational beliefs and strategy use. The original version of MSLQ contains 81 items, while we used the modified version due to shortness with 44 items on a 5-point Likert scale ranging from absolutely true to absolutely not true.^[22,23] The questionnaire comprises two main factors; motivation and learning strategies. Self-efficacy, intrinsic value, goal orientation, and test anxiety are motivational assessment subscales. The self-regulated learning subscales consist of the three following aspects; cognitive strategies, metacognitive strategies, and resource management strategies.^[24] The questionnaire has been compiled and validated in Iran by Feiz *et al.*^[25]

We translated the questionnaire to Persian and made some changes into the questions to fit the students' clinical learning context. We distributed translated questionnaires among ten students and asked them to check for unclear sentences and to re-translate questions to English. Students' feedback on translated questionnaires was discussed in a panel consisting of three medical education experts.

Filling the forms took approximately 15 minutes. All data were anonymous to maintain participants' confidentiality, and students' identity could not be traced back from the assessment data. Besides, the ethics committee of our medical center approved our study and confirmed it without any ethical issues.

Statistical analysis

Data were analyzed with the use of IBM SPSS AMOS version 18.0 (SPSS, Inc., Chicago, IL, USA). Confirmatory factor analysis and Cronbach's alpha were calculated to investigate whether the constructs of the questionnaire fitted the model and to measure the internal consistency of the factors. A one-way ANOVA and independent *t*-test were performed to compare means of SRL scores, a *P* = 0.05 was considered statistically significant. To find factors predicting the motivational beliefs, multinomial logistic regression analysis was employed.

Results

Validation of the questionnaire

To validate the questionnaire, confirmatory factor analysis showed a moderate fit in this study; CFI was 0.81 and CMIN/d. f.-ratio was, with a score of 3.75 and high, but the RSMEA was 0.053, which was reasonable. In the first model, factor scores of items 6, 13, 38, 30 and 23 were low. These items belonged to the following subscales: Cognitive strategies (2 items), metacognitive strategies (2 items), and motivational beliefs (1 item). By removing these items, an adjusted model with a good fit was obtained, a CFI of 0.88, a CMIN/d. f.-ratio of 2.97 and a RSMEA of 0.042. The internal consistency of the adjusted factors was right [Table 1] and did not improve significantly by removing any item. Thus, the adjusted model was chosen to analyze the data.

Participants' characteristics

Out of 196 questionnaires distributed in the study, 136 medical students completed the questionnaires with a response rate of 70%. Sixty-nine students were female (49.6%), nine students were married (6.5%), and 73 students lived in dormitories (52.5%). Fifty-eight students had a clinical mentor (42%).

Comparison of mentees and nonmentees in SRL and motivational beliefs scores and their subscales scores

Comparing SRL and motivational beliefs scores between clinical mentees and nonmentees indicated that motivational beliefs mean score in clinical mentees (87.5 ± 8.44) was significantly more than the others (83.49 ± 7.36) (*P* = 0.005) [Table 2].

On the contrary, in SRL scores, we did not find any significant differences between mentees and

nonmentees. Only in planning subscale scores, which itself is a subscale of metacognitive strategy, a significant difference between clinical mentees (7.03 ± 1.71) and nonmentees (6.38 ± 1.72) was found (*P* = 0.033).

Further analysis in motivational beliefs subscales scores indicated that the score of "examination-related stress" was significantly (*P* = 0.021) higher in mentees (19.30 ± 5.54) than nonmentees (17.05 ± 5.46).

After adjusting for gender, general health and dormitory status (with family) of students in a multivariate regression analysis, we found the mentor possession predicted motivational beliefs significantly (odds ratio: 7.974 [1.391–45.719], *P* = 0.020) [Table 3].

Discussion

Among the main scales, the results proved that motivational beliefs and mentor possession are correlated. According to the results of this study and previous ones done in this field, there are two possible explanation for the correlation detected; First, the mentoring program increases the motivational beliefs in medical students. Karen *et al.* have explained this impact of mentorship by giving a sense of security, constitution a "free zone" alongside the educational program and giving hope about the future.^[26] Second, due to the inherently voluntary nature of participation in TUMS mentoring program, the students with firmer motivational beliefs may have more tendency to involve in the mentoring program. The causality of this relationship can be determined in the subsequent longitudinal research. Furthermore, the existence of a correlation between exam stress and being supervised by mentors as the most significant subscale among all the motivational beliefs subscales demonstrates that the students with more exam anxiety may seek mentors more than those with less exam anxiety as one of the central roles of mentors is helping mentees to cope with stress.^[27,28]

Planning subscale is one of the other significant different subscales between students with mentors and those without mentors. Planning includes goal setting and reflecting for better material organizing and comprehending. By reviewing the existing literature and considering the content of our training workshops in TUMS mentoring program and relative discussions in the reflection sessions during the process of the program with our mentors, we assume the better planning skill can be the result of sharing mentors' experiences and advice to the mentees in this matter.^[29] Although it should be confirmed by a longitudinal study as mentioned before.

Studies claimed that teachers could increase the cognition and metacognition skills of their students by providing

Table 1: Descriptive statistics of the four factors of the motivation and self-regulated learning questionnaire, reliability coefficients and Pearson correlations

MSLQ subscales	Number of items	Mean±SD	Minimum	Maximum	1	2	3	4
1. Self-regulated learning strategy	22	76.82±8.63	56	95	(0.756)	0.886**	0.863**	0.478**
2. Cognitive strategy	13	46.77±5.14	30	60		(0.712)	0.529**	0.428**
3. Metacognitive strategy	9	30.05±4.72	18	38			(0.678)	0.408**
4. Motivational believes	25	85.92±8.24	61	112				(0.865)

Numbers in parentheses are Cronbach's alpha. *P<0.05, **P<0.01. SD=Standard deviation

Table 2: Comparison of mentees and non-mentees in self-regulated learning and motivational believes, and their subscales scores

Scale/subscale	With mentors	Without mentors	P
Cognitive strategies	46.72±5.30	46.03±3.87	0.414
Repeat and review	9.77±1.73	9.24±1.54	0.070
Noting	3.39±1.11	3.29±1.05	0.597
Summarizing	6.56±1.28	6.42±1.20	0.524
Organizing	19.26±2.63	19.46±2.43	0.821
Comprehension	7.62±1.22	7.61±1.07	0.940
Meta-cognitive strategies and management	27.06±4.09	26.16±3.15	0.267
Planning	7.03±1.71	6.38±1.72	0.033*
Monitoring and control	11.83±2.22	12.00±2.11	0.660
Arrangement	5.84±1.31	5.46±1.11	0.589
Arrangement action	3.04±1.02	2.95±1.2	0.673
Motivational believes	87.50±8.44	83.49±7.36	0.005*
Internal evaluation	15.19±2.28	14.72±2.48	0.259
Self-efficacy	33.40±4.21	32.81±3.90	0.471
Goal setting	19.42±2.31	19.07±2.58	0.423
Exam stress	19.30±5.54	17.05±5.46	0.021*

*Significant difference (P<0.05)

Table 3: Multinomial regression analysis of predictors of motivational believes subscale

Predictors	B (SE)	OR	95% CI for OR	Significant
Quartile 1 versus 4				
Intercept	-1.171 (1.815)			0.337
Gender	-0.235 (0.789)	0.791	0.168-3.714	0.766
General health	1.140 (1.053)	3.127	0.393-24.869	0.281
Dormitory status (with family)	0.173 (1.441)	1.189	0.71-20.372	0.905
Mentor possession	2.076 (0.891)	7.974	1.391-45.719	0.020
Quartile 2 versus 4				
Intercept	-1.194 (1.718)			0.487
Gender	-0.786 (0.734)	0.456	0.108-1.923	0.285
General health	1.144 (1.081)	3.139	0.377-26.145	0.290
Dormitory status (with family)	0.13 (1.408)	1.013	0.064-16.005	0.993
Mentor possession	1.729 (0.821)	5.637	1.128-28.167	0.035
Quartile 3 versus 4				
Intercept	1.200 (1.457)			0.410
Gender	-0.962 (0.823)	0.382	0.076-1.919	0.243
General health	0.300 (1.091)	1.349	0.159-11.417	0.783
Dormitory status (with family)	-3.745 (1.400)	0.024	0.002-0.368	0.009
Mentor possession	1.514 (0.824)	4.545	0.903-22.866	0.066

CI=Confidence interval, OR=Odds ratio, SE=Standard error

useful feedbacks within the hospital.^[30] These findings emphasize the potential role of mentors in the clinical setting in which teachers cannot put much effort into it because of being occupied by patient management. Therefore, based on literature, we believe by considering the SRL skills in mind and forming more goal-oriented

training for our mentors and re-planning our mentoring program in TUMS, the mentoring program can improve cognitive and meta-cognitive skills in the medical students, besides the motivational believes with educating them on reflection skills and giving feedback strategies as an example.^[31-34]

One of the strengths of this study is the large number of 4th year medical students participating in it. In addition, as far as we know, this study evaluated SRL for the first time among Iranian medical students. Our study had some limitations, including the single-center, cross-sectional nature of the study design. Therefore, there was the inability to establish any cause-and-effect relationship due to loss of the longitudinal follow-up. For example, in this study, it is not possible to determine whether mentoring has increased students' motivational beliefs, or more motivated students are more likely to participate in this mentoring program. In future work, we plan to design a longitudinal collection of the same data concomitant with educating mentors on reflective skills as an intervention by allocating control group. The second limitation is the suboptimal response rate and the possibility of response bias. Another limitation was using the modified version of the motivation and SRL questionnaire instead of the original one in order to increase the students' enrollment. Finally, the survey we used, had reliability and validity limitations, although our CFA and reliability analyses suggest that employed instrument had reasonable psychometric properties.

Conclusion

Based on the results of this study, we can conclude that having experienced mentors to consult with in challenging items medical students face in clinical environment had significant positive correlation with medical students' skills regarded to motivational belief and planning which is subcategorized in SRL's category of metacognitive strategy. Since the study is designed as cross-sectional, we cannot generalize our results in order to interpret the role of mentoring programs on SRL as a cause-and-effect relationship. Thus, future longitudinal and interventional research besides the customized mentoring program is required to recommend the peer mentoring program to enhance SRL skills in the medical students especially during their transition to the new clinical environment.

Acknowledgments

We would like to thank all students who participated in this study for devoting their time for filling the questionnaires. Ethical Committee of TUMS (No.IR.TUMS.VCR.REC.1399.3261) approved the protocol of this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Haglund ME, Rot MA, Cooper NS, Nestadt PS, Muller D, Southwick SM, *et al.* Resilience in the third year of medical school: A prospective study of the associations between stressful events occurring during clinical rotations and student well-being. *Acad Med* 2009;84:258-68.
2. Radcliffe C, Lester H. Perceived stress during undergraduate medical training: A qualitative study. *Med Educ* 2003;37:32-8.
3. Dubé TV, Schinke RJ, Strasser R, Couper I, Lightfoot NE. Transition processes through a longitudinal integrated clerkship: A qualitative study of medical students' experiences. *Med Educ* 2015;49:1028-37.
4. Treadway K, Chatterjee N. Into the water – The clinical clerkships. *N Engl J Med* 2011;364:1190-3.
5. Bjork RA, Dunlosky J, Kornell N. Self-regulated learning: Beliefs, techniques, and illusions. *Annu Rev Psychol* 2013;64:417-44.
6. Brydges R, Butler D. A reflective analysis of medical education research on self-regulation in learning and practice. *Med Educ* 2012;46:71-9.
7. Zimmerman BJ. Becoming a self-regulated learner: Which are the key subprocesses? *Contemp Educ Psychol* 1986;11:307-13.
8. Artino AR Jr., Dong T, DeZee KJ, Gilliland WR, Waechter DM, Cruess D, *et al.* Achievement goal structures and self-regulated learning: Relationships and changes in medical school. *Acad Med* 2012;87:1375-81.
9. Greveson G, Spencer J. Self-directed learning—the importance of concepts and contexts. *Med Educ* 2005;39:348-9.
10. Sitzmann T, Ely K. A meta-analysis of self-regulated learning in work-related training and educational attainment: What we know and where we need to go. *Psychol Bull* 2011;137:421.
11. Stegers-Jager KM, Cohen-Schotanus J, Themmen AP. Motivation, learning strategies, participation and medical school performance. *Med Educ* 2012;46:678-88.
12. Zimmerman BJ. Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *Am Educ Res J* 2008;45:166-83.
13. Pajares F. Gender and perceived self-efficacy in self-regulated learning. *Theory Pract* 2002;41:116-25.
14. Schunk DH. Goal setting and self-efficacy during self-regulated learning. *Educ Psychol* 1990;25:71-86.
15. Premkumar K, Pahwa P, Banerjee A, Baptiste K, Bhatt H, Lim HJ. Does medical training promote or deter self-directed learning? A longitudinal mixed-methods study. *Acad Med* 2013;88:1754-64.
16. Brydges R, Manzone J, Shanks D, Hatala R, Hamstra SJ, Zendejas B, *et al.* Self-regulated learning in simulation-based training: A systematic review and meta-analysis. *Med Edu* 2015;49:368-78.
17. Perry NE, Phillips L, Hutchinson L. Mentoring student teachers to support self-regulated learning. *Elem Sch J* 2006;106:237-54.
18. Perry NE, Hutchinson L, Thauberger C. Talking about teaching self-regulated learning: Scaffolding student teachers' development and use of practices that promote self-regulated learning. *Int J Educ Res* 2008;47:97-108.
19. Mullen CA. Facilitating self-regulated learning using mentoring approaches with doctoral students. In: *Handbook of Self-Regulation of Learning and Performance*. Taylor & Francis 2011. p. 137-52. [doi: 10.4324/9780203839010.ch9].
20. Shochet RB, Colbert-Getz JM, Wright SM. The Johns Hopkins learning environment scale: Measuring medical students' perceptions of the processes supporting professional formation. *Acad Med* 2015;90:810-8.
21. Adoga AA, Kokong DD, Dakum NK, Ma'an ND, Iduh AA, Okwori ET, *et al.* The undergraduate medical student's perception of professional mentorship: Results from a developing nation's medical school. *J Educ Health Promot* 2019;8:53.

22. Pintrich PR. A Manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ). University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning 1991.
23. Lee JC, Zhang Z, Yin H. Using multidimensional Rasch analysis to validate the Chinese version of the Motivated Strategies for Learning Questionnaire (MSLQ-CV). *Eur J Psychol Educ* 2010;25:141-55.
24. Pintrich PR, De Groot EV. Motivational and self-regulated learning components of classroom academic performance. *J Educ Psychol* 1990;82:33.
25. Feiz, P, Hooman H. Assessing the Motivated Strategies for Learning Questionnaire (MSLQ) in Iranian students: Construct validity and reliability. *Procedia Soc Behav Sci* 2013;84:1820-5.
26. Kalén S. Mentorship for Medical Students: Space for Something Else. *karolinska institute* 2013.
27. Levy BD, Katz JT, Wolf MA, Sillman JS, Handin RI, Dzau VJ, *et al.* An initiative in mentoring to promote residents' and faculty members' careers. *Acad Med* 2004;79:845-50.
28. Hashemi Z, Shokrpour N, Valinejad M, Hadavi M. Communication apprehension and level of anxiety in the medical students of Rafsanjan University of Medical Sciences. *J Educ Health Promot* 2020;9:350.
29. Zink BJ, Hammoud MM, Middleton E, Moroney D, Schigelone A. A comprehensive medical student career development program improves medical student satisfaction with career planning. *Teach Learn Med* 2007;19:55-60.
30. Cutting MF, Saks NS. Twelve tips for utilizing principles of learning to support medical education. *Med Teach* 2012;34:20-4.
31. Chew KS, Durning SJ, Van Merriënboer JJ. Teaching metacognition in clinical decision-making using a novel mnemonic checklist: An exploratory study. *Singapore Med J* 2016;57:694.
32. Song HS, Kalet AL, Plass JL. Assessing medical students' self-regulation as aptitude in computer-based learning. *Adv Health Sci Educ* 2011;16:97-107.
33. Tanner KD. Promoting student metacognition. *CBE Life Sci Educ* 2012;11:113-20.
34. Bhattacharrya H, Medhi GK, Pala S, Sarkar A, Kharmujai OM, Lynrah W, *et al.* Early community-based teaching of medical undergraduates for achieving better working skills in the community. *J Educ Health Promot* 2018;7:161.