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Evaluation of self-regulatory learning strategies status in medical and nursing students of Zanjan University of Medical Sciences in the academic year 2018-19

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Abstract

Background & Objective: In terms of learning psychology, one of the effective factors in learning is self-regulatory strategies. Accordingly, this study was conducted to determine the status of self-regulatory learning strategies in medical and nursing students of Zanjan University of Medical Sciences.

Materials and Methods: The statistical population included all medical and nursing students of Zanjan University of Medical Sciences in the academic year of 2018-19, whose number was 390. The type of study was descriptive cross-sectional and the research tools included demographic information questionnaire and Pint rich and De Groot self-regulated learning strategies questionnaire. The collected data were analyzed using descriptive statistics such as mean and standard deviation and inferential statistics including independent t-test and PSS16 statistical software.

Results: This study showed that both groups of medical and nursing students use self-regulatory strategies in an acceptable way and their difference was not statistically significant (P <0.05). But there was a statistically significant difference between the mean scores of supervision and control in the two groups (P <0.003).

Conclusion: Based on the results, students use self-regulatory strategies to some extent and the field of study does not affect the average of students 'self-regulatory learning strategies. In order to improve students' self-regulatory learning strategies, other factors related to self-regulatory strategies should be considered.

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Introduction

Given the high cost and critical nature of medical and nursing education, it requires particular focus to solve educational problems and thus improve community health optimally. This goal is achieved by employing and identifying effective and proper educational methods and factors such as Self-Regulated Learning (SRL) strategies. SRL strategies are active and passive information processing activities used by learners to facilitate the acquisition, storage, and recalling of previously learned material during encoding (1). Murtagh and Todd recognize SRL as an active and organized process in which the learners set learning goals, then try to monitor, control, and regulate their motivation, recognition, and behaviors (2). Zimmerman regards SRL strategies as a type of learning in which learners rely on themselves for the acquisition of skills and knowledge rather than instructors (3).

According to Zimmerman and Martinez-Pons, significant components of SRL are cognition, metacognition, and motivational beliefs. The SRL is based on how learners organize these three components (4). Pint rich and DeGroot argued that cognitive processes are the SRL strategies that promote the academic achievement of learners by facilitating learning (5). Linnenbrink and Pint Rich believe that while a poor cognitive status negatively impacts the academic achievement of the learners, an adequate cognitive status will have an opposite result (6). Metacognition is the second major component of SRL that was coined by John H. Flavell. The term metacognition means 'above

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cognition,' and is used to indicate cognition about cognition, or more informally, thinking about thinking. It signifies cognitive processes, monitoring, planning, and learning assessment. The metacognitive strategies gained the attention of educational researchers so that there is a consensus among them that the academic achievement of learners is influenced by such strategies (7).

Good et al. have defined metacognitive strategies as a method for the selection of the appropriate learning methods, monitoring, correcting mistakes, replace the learning methods with the new strategies (8). Metacognitive strategies will reduce test anxiety of the students and promote academic achievement (9). Metacognitive strategies enable learners to assess and process experiences in new methods and regard stressful situations as an opportunity rather than a threat (10). The third component of SRL strategies is motivation, which its impact as a prerequisite mental or behavioral readiness for learning has been proven (11). Slavin defines motivation as one of the driving forces of human activities; he emphasizes that motivation has a multidimensional structure that associate with learning and academic achievement (12). According to scholars, learners cannot benefit from even the most comprehensive educational programs unless they are motivated (13). There are various approaches regarding the impact of motivation, such as behavioral, cognitive, humanistic, and socio-cultural approaches, in which all of them influence academic achievement (14). Since the accomplishment of each academic staff depends on the motivation of learners, Amini et al. argue that professors should practice incentive approaches in the modern educational planning to motivate students for learning and academic accomplishments (13).

The study of Narimani et al. indicated a higher mean score of SRL for ordinary students than those with learning disabilities (15). Sideridis et al. performed a study that indicated a lower performance in students with learning disabilities than ordinary students in terms of metacognition, motivation, self-efficacy, and task performance (16). There was a significant relationship between achievement motivation and academic achievement, according to the study of Tammanaeefar et al. (17). The research of Hossein Mardi et al. suggested a significant and predictive role of achievement motivation and academic achievement (18).

Solhi et al. performed a study at Iran University of Medical Sciences that indicated a significant correlation between SRL strategies and academic achievement of students. It can be inferred from the findings that students who utilized SRL strategies had higher academic achievement (19). Alotaibi conducted a study among nursing and medical emergency students that suggested a positive and significant relationship between SRL strategies and academic achievement (20). Agustiani et al. and Goradia et al. achieved similar results on the employment of SRL strategies and academic environments (21, 22). Due to the critical role of SRL strategies in academic achievement and the inadequate number of researches, in this case, this study aimed to determine the impact of SRL on the medical and nursing students. Despite the extensive number of studies on the SRL strategies and creativity, still, the traditional education methods are the standard and accepted approach in most of the academic fields, especially medicine (18).

Materials and Methods

This descriptive cross-sectional study was approved by the ethical code number of 13820702962009 at the Islamic Azad University of Zanjan. The statistical population consisted of all the medical and nursing students of Zanjan University of Medical Sciences during the academic year of 2018-2019. Due to the availability of the statistical population, the convenience sampling method was used in this study. The sample size was composed of 390 individuals, of whom 115 men and 97 women were medical students, and 86 men and 92 women were nursing students. The inclusion criteria were studying either medicine or nursing, having a GPA of in the first semester of 2018-

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2019 academic year; subjects were free to withdraw from the study at any time.

Data were collected by a demographic questionnaire and Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich & De Groot (1990). It contains 47 items on cognitive, metacognitive strategies, and motivational beliefs. Cognitive strategies have three scales, including repetition and rehearsal (three items), note-taking and elaboration (one item), summarizing (two items), organization (five items), and comprehension (two items). Metacognitive strategies are composed of nine scales, such as planning (two items), monitoring and control (four items), effort and perseverance (2 items), and self-regulation (one item). The motivational beliefs section consists of 25 scales, such as self-efficacy (nine items), goal orientation (five items), intrinsic assessment (four items), and test anxiety (seven items) (7). The scales of these items were designed and developed by Weinstein, Schulte, and Palmer (1987), Harter (1981), and Ankles (1983) (23). The Cronbach's alpha consistency measurement calculated the reliability coefficients of the three factors of motivational beliefs, including self-efficacy, intrinsic assessment, and test anxiety were 0.89, 0.87, and 0.75, respectively; and for SRL strategies including cognitive and metacognition were 0.74 and 0.83, respectively. This questionnaire was designed as an "objective test" with five multiple-choice items, including strongly disagree, disagree, neutral, agree, and strongly agree, which scored in a five-scale system of one to five, respectively. The reliability and validity coefficients of this questionnaire were previously determined by Mousavinejad in Iran (24).

The instrument reliability was confirmed by Cronbach's alpha of 0.83. The researcher attended the classrooms after preparing the questionnaires and coordinating with authorities. Then the objectives of the study were elaborated to the students, upon obtaining informed and voluntary consent, the questionnaire was distributed among them and collected after completion. Data were extracted by SPSS software version 16 and analyzed with clear indicators and independent t-test. Kolmogorov–Smirnov test verified normal distribution of data; the results indicated an equal distribution of motivational beliefs, cognition, and metacognition strategies. The equality of variances for variables was assessed with the Levene's test. Individuals participated in this study voluntarily and with their consent, and they were able to withdraw if they wished. The information of all the participants was confidential and encrypted.

Results

The participants completed 390 questionnaires in this study, and demographic data indicated that a men-women ratio in medical and nursing students were 54.2%-45.8% and 48.3%-51.7%, respectively. The mean age of medical and nursing students was 21 and 21.1 years old, respectively, which is almost identical. 1.9% of medical students and 9.6% of nursing students were married. The results Chi-square test indicated an insignificant difference per demographic characteristics among medical and nursing students.

There was no significant difference in the mean scores of all cognitive strategies between the medical and nursing groups, which is presented in Table.2 (p-value more than 0.05). Additionally, there was no significant difference (p-value=0.056) for the mean scores of metacognitive strategies among medical (27.34) and nursing (27.82) students, which is presented in Table.3. While this insignificance difference is verified with a 95% confidence level, there was a statistically significant difference (p-value=0.003) between the mean scores of "monitoring and control" among two groups.

According to Table.4, the mean score of the "motivational beliefs" in medical and nursing students is 82.21 and 84.68, respectively. Based on the calculated p-value of 0.74 and a confidence level of 95%, it can be concluded that there is no significant relationship between the medical and nursing students in terms of motivational beliefs.

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Table 1: Absolute and relative frequency of research samples according to the field of study in medical and nursing groups

Variables		Medical		Nursing	
		Number	Percentage	Number	Percentage
Sex	Male	115	54.2	86	48.3
	Female	97	45.8	92	51.7
Age	Mean Age	21		21.1	
	Standard Deviation	1.9		1.9	

Table 2. Comparison between the scores of the variables of cognitive strategies according to the field of study in medical and nursing groups

Variables	Studied groups				Independent T-test (P value)
	Medical		Nursing		
	Mean	Standard Deviation	Mean	Standard Deviation	
Repetition and Review	9.47	1.92	9.85	1.86	0.55
Extension	3.50	1.17	3.51	1.17	0.63
Summarizing	6.85	1.63	6.85	1.63	0.36
Organizing	17.09	3.35	18.29	2.98	0.32
Comprehension	7.54	1.36	7.76	1.24	0.27
(total)	44.48	6.70	46.76	6.24	0.58

Table 3. Comparison between the scores of the variables of Metacognitive strategies according to the field of study in medical and nursing groups

Variables	Studied groups				Independent T-test (P value)
	Medical		Nursing		
	Mean	Standard Deviation	Mean	Standard Deviation	
Curriculum	7.09	1.62	7.15	1.82	0.31
Monitoring and control	12.36	2.38	12.78	1.94	0.003
Regulation (effort and perseverance)	5.39	1.41	5.42	1.31	0.6
Activity and discipline	2.49	1.07	2.46	0.97	0.19
(total)	27.34	4.22	27.82	3.65	0.053

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Table 4.Comparison between the scores of the motivational belief variables of according to the field of study in medical and nursing groups

Variables	Studied groups				Independent T-test (P value)
	Medical		Nursing		
	Mean	Standard Deviation	Mean	Standard Deviation	
Efficacy	32.17	5.10	33.23	4.64	0.035
Target orientation	17.91	3.25	18.91	2.83	0.64
internal evaluation	13.41	3.03	14.33	2.61	0.13
exam stress	18.70	5.70	18.20	5.43	0.63
(Total)	82.21	9.61	84.68	9.58	0.74

Discussion

This study aimed to determine the impact of SRL strategies (motivational, cognitive, and metacognitive) on the medical and nursing students. The mean scores of the three SRL factors for the two medical and nursing groups were as follows: cognition 44.48 and 46.76, metacognition 27.34 and 27.82, and motivational beliefs 82.21 and 84.68. The mean scores indicated no significant relationship between medical and nursing groups since both disciplines were analogous fields of studies and had several common traits. According to the results, both medical and nursing students have appropriately utilized these strategies for academic achievements. Ostovar and Abedi have conducted a survey that revealed a significant relationship among failed and ordinary students, which was inconsistent with the results of this study since our sample size only included ordinary students. The results can be elaborated concerning the citations of Zimmerman and Kiysantas (3), who believed the majority of the students use SRL strategies, and the only variation belongs to their knowledge of the strategy and motivation.

Students try to make logical connections with previous information while studying new materials and become aware of their learning by utilizing metacognitive strategies. They usually use cognitive strategies and regard assignments as a challenge and seize it as a learning opportunity. Therefore, all the samples had equally used cognitive and metacognitive strategies due to their similar education and performance level. The study of Ostovar and Abedi (25), had two different types of samples, so the different application of cognitive and metacognitive strategies indicates that failed students could not correctly use these strategies. The results of this study are consistent with the research of Ghadampoor, Yusefvand, and Radmehr (26), which confirmed a significant difference in the score of academic hope of the experimental group after the intervention of cognitive and metacognitive strategies. According to results, cognitive and metacognitive strategies have significantly increased the academic hope in the experimental group compared to the control group, which means that the samples had experimented with these strategies before. This consistency can be elaborated by the influence of cognitive and metacognitive strategies on academic achievement; therefore, the awareness and application of these strategies are effective in the learning. Pyhältö et al. (27) have concluded that compared to other students, students who have cognitive enthusiasm are more willing to

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spend enough time studying can effectively cope with the requirements of education and efficiently handle academic problems, which is consistent with the results of our study.

There was no significant difference in the motivational beliefs (self-efficacy, goal orientation, intrinsic assessment, test anxiety) for the control and experimental groups, which means both groups utilize these strategies in academic achievements. This is inconsistent with the findings of Pint rich and DeGroot (5), Narimani *et al.* (15), and Pelage (28). According to the Pint, failed students have less motivation for learning due to a lower level of test anxiety or learning disability. Since the characteristics of failed students are different from ordinary students, they have different levels of self-efficacy, goal orientation, and intrinsic assessment. The sample of this study consisted of ordinary and analogous subjects; that is why the results of the current study are inconsistent with the study of Pint. This study was inconsistent with the findings of Stipek (29). Their subjects were assessed as competent, self-sufficient, and independent during the study. According to Artino *et al.* (30), motivational beliefs and perfectionism cause students to focus on problem-solving strategies with self-confidence. Therefore, a continuous cycle is created, which suggests that motivation leads to learner success, and success causes motivation. The samples of this study are expected to be analogous per motivational beliefs. Since the samples of both medical and nursing groups have passed the difficult entrance exam, they regard themselves as competent and worthy and are anxious to maintain this position.

The research of Saraei *et al.* (31) is inconsistent with this study due to the diverse nature of students, teachers, and the educational environment. It can be maintained that the difference between medical or nursing students with others is due to their expectations, modeling, and progressive discipline. This study indicated a significant relationship in the mean score of "supervision and monitoring" among medical (12.36) and nursing (12.78) students (p-value less than 0.003). The findings of this study were consistent with the research of Arami *et al.* (32), which indicated a higher mean score of SRL strategies in ordinary students compared to the gifted students. The findings of this study were in line with the research of Sabz Makan *et al.* (33), which indicated a higher mean score of "supervision and control" in the midwifery and health education students compared to other fields of study. It can be stated that similar to gifted students; medical students do not employ "supervision and control" strategies due to higher levels of intelligence. Moreover, it is noteworthy to know the nursing students were familiar with SRL methods and strategies and consciously designed their curriculum; therefore, nursing students utilized "supervision and monitoring" better than medical students.

Students who correctly adjusted themselves to the SRL strategies will improve their academic achievements by personalizing their perception of the new material, making logical connections with previous learnings, control, planning, and adapting their performance. Therefore, these students use metacognitive strategies to observe their learning process (34). Since adopting students to learning, strategies required understanding and awareness of SRL strategies; therefore, it is advised to run SRL workshops in the universities and prioritize the strategical planning of professors as the main focus of human resources management to improve academic knowledge.

In general, terms, performing this study at an optimal level is difficult. The researcher encountered several limitations in the course of the study that some of them are mentioned here:

1. The findings of this study cannot be generalized to other disciplines since the samples only included medical and nursing students.
2. This study is limited to Zanjan city, generalizing the results to other cities should be practiced with caution.
3. Since the data acquisition performed with a questionnaire, therefore they may be subject to the one-sided reference bias.

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Conclusion

According to the results, the field of study is not an influential factor in the mean scores of SRL strategies; therefore, it is advised to utilize other valid criteria to improve these strategies.

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Conflicts of Interest: The authors declare that there are no conflicts of interest.

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