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Comparative Investigation of Academic Motivation and Academic Achievement among Dentistry, Pharmacy and Medicine Students of Kermanshah University of Medical Sciences

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ABSTRACT

Background and aim: Academic motivation is among the essential factors influencing students' academic achievement. It has been shown that there is a relationship between learning and motivation, as previous knowledge of learners affects their motivation. Therefore, this study was conducted in 2019 to compare the academic motivation and academic achievement of students majoring in dentistry, pharmacy, and medicine at Kermanshah University of Medical Sciences, Iran.

Materials and methods: The present analytical study was conducted in the first semester of 2019/2020. The statistical population consisted of dental, medical, and pharmaceutical students (n=240) at Kermanshah University of Medical Sciences, who were randomly selected and participated in the study. Data were collected using a demographic information form and an academic motivation scale. Data were analyzed by analysis of variance and SPSS version 25 software.

Results: There was a significant difference in the mean score of intrinsic motivation (to know) between dental, medical, and pharmaceutical students ($P < 0.05$). There was also no significant difference in the mean score of extrinsic motivation (integrated regulation) between the students of the School of Dentistry, Medicine, and Pharmacy ($P > 0.05$). In other words, strengthening academic motivation led to an increase in students' academic achievement. Moreover, there was no significant relationship between academic motivation and academic achievement between dental and pharmaceutical students ($P > 0.05$).

Conclusion: Motivational factors play an essential role in academic performance, and since academic achievement in dental, medical, and pharmaceutical students is associated with community health, it is suggested that medical school officials and planners pay further attention to the components of motivation.

1. Introduction

Academic motivation is one of the essential factors influencing students' academic achievement.^[1] It has been shown that there is a relationship between learning and motivation, as previous knowledge of learners affects their motivation.^[2] Motivation is an intrinsic phenomenon that forces a person to act from within and arises from the needs of the individual,^[3] which plays a very important role in explaining the cause of the behavior, predicting the effects of work and guiding behaviors to achieve the goal, energizes the learners, guides their activities, and fosters behaviour.^[4] Studies show that most innovations, productions, discoveries, and creations result from high effort and motivation.^[5] Kit & Kool points out that people with higher

academic motivation are more active, perform more tasks, and are more successful.^[9] If the person concludes that his or her academic or professional activity does not address the targeting of his or her goals and needs, the mentioned psychological force will decrease, and motivational deficiencies will occur. Therefore, the person will be cognitively hesitant to continue their activities.

Disorders in motivation at the level of emotions and behavior can lead to problems and result in anticipation of pessimism, anxiety, depression, and mental health problems, as well as a dramatic drop in the personal, social and career performance, and negatively affect the academic performance of students.^[6] Due to the impact of academic achievement motivation on student

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success, in recent decades, psychologists have sought to investigate and identify factors influencing academic achievement motivation. Their research findings show that personality, family, educational and social variables are related to this structure.^[7] Motivation is influenced by four factors: environmental position, external stimulus, goal, and goal achievement tools. Humans are motivated to achieve their goals, needs, and instincts. For science seekers and students, the motivation for academic achievement is of particular importance. With this motivation, people pursue the necessary mobility to complete a task successfully, achieve a goal, or achieve a certain degree of competence in their work so that they can finally achieve the required success in learning and academic achievement.^[8] Therefore, it can be said that motivation shows the reasons for people's behavior and determines why they act in a certain way. Motivational behavior is energetic, directional, and sequential behavior. From an educational point of view, motivation is a multifaceted structure related to learning and academic achievement.^[9] Experts have divided motivation into two main groups: intrinsic motivation and extrinsic motivation. The inherent motivation induces the necessary attraction for activity while the person under the influence of extrinsic motivation achieves a specific activity with an independent goal.^[8] Psychologists have pointed out the need to pay attention to motivation in education due to its productive relationship with new learning, skills, strategies, and behaviors. Academic achievement motivation is one of the basic structures proposed to explain this motivation. Academic achievement motivation refers to behaviors leading to learning and progress.^[10] In other words, the academic achievement motivation is the pervasive desire to do something well in a particular area and to evaluate one's performance spontaneously. Most behaviors that demonstrate academic motivation include insisting on challenging tasks, working hard to learn to master, and choosing tasks that require effort. Thus, the academic achievement motivation, or intrinsic motivation, is a psychological state that is achieved when a person considers himself or herself to have the necessary adequacy and autonomy.^[11]

Research has shown that motivation to succeed is related to proper performance in the workplace. There seems to be a relationship between the extreme need for success and effective performance at work (education and occupation). The essential factor for success, behind ability, is motivation and quality of education. Highly motivated students have completed more assignments during their courses, resulting in higher levels of success. In many cases, the presence or absence of motivation leads to success or failure.^[12] Accordingly, examining students' motivation and discovering their problems and trying to solve them can remove many educational barriers. Therefore, this study was conducted to compare the academic motivation of dental, medical, and pharmaceutical students.

2. Materials and methods

The present cross-sectional and descriptive-analytical study was conducted on the study population of dental, pharmaceutical, and medical students at Kermanshah University of Medical Sciences in Iran. The sample size was 234 using Morgan and Krejcie tables with a statistical population of 600 people. Sampling was random and stratified. Eighty people from each faculty entered the study at random. Inclusion criteria included studying in the academic year of 2019/2020 and spending at least four semesters in the school. Demographic information form (gender, age, marital status, etc.) and academic motivation scale were used to collect data. The questionnaire was developed by Vallerand and Blasonnette (1992) in Canada.

The scale is based on self-determination theory and has 28 seven-point Likert scales that measure three dimensions of intrinsic motivation, extrinsic motivation, and motivation. Researchers such as Vallerand (1992) have

divided the intrinsic motivation component of Desi and Ryan (1985) into several sub-components, including intrinsic motivation to know, to accomplish, and to experience stimulation. Extrinsic motivation is the motivation that forces people to do homework because of external rewards and reinforcements when they are extrinsically motivated and work to achieve something more than their pleasure. The motivation means that people do not receive any motivation, neither inner satisfaction, value, or external stimuli, for their activities, and thus avoid doing activities.^[13, 14] The sub-components and questions related to each component include, intrinsic motivation (to know): (2-9-16-23), intrinsic motivation (to accomplish): (6-13-20-27), intrinsic motivation (to experience stimulation): (4-11-18-25), extrinsic motivation (integrated regulation): (3-10-17-24), extrinsic motivation (introjected regulation) (7-14-21-28), extrinsic motivation (external regulation): (1-8-15-22), and motivation (5-12-19-26). The score of the questionnaire is based on the 5-point Likert scale, including 1 = agree, 2 = somewhat agree, 3 = neither agree nor disagree, 4 = somewhat disagree, and 5 = disagree. The minimum score is 28, the average score is 88, and the maximum score is 140. If the score of the questionnaire is between 28 and 50, the level of academic motivation in this community is poor. If the score of the questionnaire is between 50 and 88, the level of academic motivation is moderate. If the score is above 88, the level of academic motivation is acceptable. This test was first used by Bohrani (1993), who examined its reliability and validity.^[15] The tool contained seven subscales, intrinsic motivation to know, intrinsic motivation to accomplish, intrinsic motivation to experience stimulation, identified regulation, introjected regulation, extrinsic motivation, and motivation. Vallerand et al. reported that Cronbach's alpha coefficients for subscales were between 0.83 and 0.87. This scale is standardized for high school students in Tehran. Their standardized results indicate a reduction in the structure of the seven factors and the scale of academic motivation with a slight modification to the five factors, acceptable validity and reliability and Cronbach's alpha coefficients between 0.55 and 0.87.^[16]

The researchers also reduced the seven-factor structure of the scale to three factors, and Cronbach's alpha coefficients for three subscales were calculated to be 0.79, 0.84, and 0.86, respectively. The scale was also divided into three sections: intrinsic, extrinsic, and motivation. According to the researchers, Desi and Ryan also divided academic motivation into intrinsic, extrinsic, and motivation. In this study, reliability was calculated using Cronbach's alpha coefficient of 0.80. Data were analyzed descriptively and inferentially using SPSS version 25 software at the error level of 0.05. The Kolmogorov-Smirnov test was used to evaluate the normal distribution of the scores of the studied parameters. Descriptive statistics methods such as mean, standard deviation for quantitative traits were used to summarize and describe the variables. The analysis of variance, as well as Tukey post-hoc test, were used to compare the mean score of academic motivation among students in the faculties of dentistry, medicine, and pharmacy. This study was conducted with the approval of the Ethics Committee (IR.KUMS.REC.1398.885) from Kermanshah University of Medical Sciences and with the coordination of the officials of the School of Dentistry.

3. Results

The present study was conducted with the participation of 240 students from the School of Dentistry, Pharmacy, and Medicine. The mean age of students was 25.3 years with a standard deviation of 3.4 years, with a minimum age of 18 and a maximum age of 43. The mean grade point average (GPA) of students was 15.9, with a standard deviation of 1.1. The minimum grade point average was 13, and the maximum was 19; 68.3% of the

participants were male, and 90.4% were single; 47.5% of the students were living in the dormitory, 43.3% with their families.

Table 1 showed that there was a significant difference between the mean score of intrinsic motivation (to know) in dental, medical, and pharmaceutical students ($P < 0.05$). Also, the results of the comparison between the means of intrinsic motivation (to accomplish) subscale among students of different faculties showed that no significant difference was observed in inherent motivation (to accomplish) subscale ($P > 0.05$). Findings from the analysis of variance in the intrinsic motivation (to experience stimulation) subscale showed that there was a significant difference in the mean score of inherent

motivation (to experience stimulation) between the students of different faculties ($P < 0.05$). According to Table 2, there was no significant difference in the mean score of extrinsic motivation between dental, medical, and pharmaceutical students ($P > 0.05$). Moreover, the results of this test showed that there was a significant difference in the mean score of the extrinsic motivation (introjected regulation) subscale between students of different faculties ($P < 0.05$). In addition, the results of a comparison between the mean scores of extrinsic motivations (external regulation) between different students showed that no significant difference was observed in the extrinsic motivation (external regulation) subscale ($P > 0.05$) (Table 3).

Table 1. Comparison of the mean scores of intrinsic motivation subscales based on dentistry, medicine, and pharmacy faculties.

Faculties/ Variables	Dentistry	Medicine	Pharmacy	Statistical index
	Mean \pm standard deviation	Mean \pm standard deviation	Mean \pm standard deviation	
Intrinsic motivation (to know)	7.2 \pm 2.4	7.7 \pm 2.5	8.2 \pm 2.8	p-value=0.046 F=3.12
Intrinsic motivation (to accomplish)	8.8 \pm 2.6	8.1 \pm 2.1	8.8 \pm 2.9	p-value=0.139 F=1.99
Intrinsic motivation (to experience stimulation)	9.8 \pm 2.7	8.7 \pm 2.9	9.9 \pm 3.1	p-value=0.022 F=3.90

Table 2. Comparison of the mean scores of extrinsic motivation subscales based on dentistry, medicine, and pharmacy faculties.

Faculties/ Variables	Dentistry	Medicine	Pharmacy	Statistical index
	Mean \pm standard deviation	Mean \pm standard deviation	Mean \pm standard deviation	
Extrinsic motivation (integrated regulation)	7.7 \pm 2.5	8.5 \pm 3.5	8.8 \pm 3.1	p-value=0.085 F=2.48
Extrinsic motivation (introjected regulation)	8.2 \pm 2.9	7.2 \pm 1.8	7.7 \pm 2.1	p-value=0.024 F=3.80
Extrinsic motivation (external regulation)	6.5 \pm 2.06	6.9 \pm 1.7	6.7 \pm 1.8	p-value=0.315 F=1.16

According to Table 4, the results of the analysis of variance showed that there was a significant difference in the mean level of motivation between dental, medical, and pharmaceutical students ($P < 0.05$). In addition, the table

shows that the findings from the analysis of variance indicated a statistically significant difference in the mean level of academic motivation between dental, medical, and pharmaceutical students ($P < 0.05$).

Table 3. Pairwise comparison of mean scores of intrinsic motivation subscales based on faculty using Tukey test.

Variables	Faculty		Mean difference	P-value
Extrinsic motivation (introjected regulation)	Dentistry	Medicine	1.025	0.017
		Pharmacy	0.550	0.303
	Medicine	Pharmacy	-0.475	0.410

Table 4. Comparison of mean scores of motivation subscale and academic motivation scale based on the faculties of dentistry, medicine, and pharmacy.

Faculties/ Variables	Dentistry	Medicine	Pharmacy	Statistical index
	Mean \pm standard deviation	Mean \pm standard deviation	Mean \pm standard deviation	
Motivation	12.4 \pm 4.5	9.1 \pm 3.4	10.3 \pm 3.7	p-value=0.001 F=14.1
Academic motivation (total score)	60.7 \pm 11.7	56.4 \pm 12.8	60.6 \pm 13.5	0.040

According to the findings, the academic motivation of dental students was 21.3% weak, 77.7% moderate, and 1.3% acceptable. In medical students, 42.5% were weakly motivated, and 57.5% were moderate. The academic motivation was poor in 30% of pharmaceutical students and 70% moderate. According to Table 5, based on the findings of the Pearson correlation test, there was no direct and significant relationship in intrinsic motivation and academic achievement between dental, pharmaceutical, and medical students

($P < 0.05$). Based on the findings of this test, a direct and significant relationship was found in extrinsic motivation between medical students and their academic achievement ($r = 0.239$ and $P = 0.033$). According to the findings, there was a significant negative correlation between motivation and academic achievement (GPA) in medical ($r = -0.234$ and $P = 0.037$) and pharmaceutical ($r = -0.33$ and $P = 0.003$) students. Based on the findings of this test, a direct and significant relationship was observed between academic

motivation and academic achievement in medical students ($r = 0.267$ and $P = 0.017$). In other words, increasing academic motivation increases students' academic achievement. There was no significant relationship between

academic motivation and academic achievement of dental and pharmaceutical students ($P > 0.05$).

Table 5. Correlation between academic motivation and its subscales with academic achievement in students.

Faculties/ Variables	Correlation coefficient	P-value
Intrinsic motivation (to know)	Dentistry	0.155
	Medicine	0.145
	Pharmacy	0.076
Intrinsic motivation (to accomplish)	Dentistry	0.132
	Medicine	0.221
	Pharmacy	0.146
Intrinsic motivation (to experience stimulation)	Dentistry	0.200
	Medicine	0.249
	Pharmacy	0.074
Extrinsic motivation (integrated regulation)	Dentistry	0.001
	Medicine	0.239
	Pharmacy	0.05
Extrinsic motivation (introjected regulation)	Dentistry	0.39
	Medicine	0.56
	Pharmacy	0.21
Extrinsic motivation (external regulation)	Dentistry	0.067
	Medicine	0.062
	Pharmacy	0.145
Motivation	Dentistry	-0.045
	Medicine	-0.234
	Pharmacy	-0.330
Academic motivation (total score)	Dentistry	0.147
	Medicine	0.267
	Pharmacy	0.145

4. Discussion

In the present study, the mean total clinical score was determined as a criterion for academic achievement. Based on the findings and general, students' academic motivation was 31.3% weak, 68.3% moderate, and 1.4% acceptable. The academic motivation of dental students was 21.21% weak, 77.5% moderate, and 1.3% acceptable. In addition, 42.5% of medical students were poorly motivated, and 57.5% were moderate. The academic motivation was poor in 30% of pharmaceutical students and 70% moderate. These findings were inconsistent with the results of Jolehar^[17] and Rouhi.^[3] In the study of Jolehar, 64.5% of subjects were highly motivated. Rouhi et al.^[3] showed that 53.3% of students had higher than average academic motivation scores, indicating a relatively favorable motivation. The results of the present study showed that the academic motivation of pharmaceutical students was higher than other students. This finding was consistent with the results of a study by Bakhshi et al.^[7] Students' intrinsic and extrinsic motivation scores were moderate. Moreover, the results of Rouhi et al. indicated that 23.3% of medical students in the intrinsic motivation scale had a higher than average score that is inconsistent with the results of the present study. The subjects with intrinsic motivation emerge from within the order and do not allow others and extrinsic factors to affect their performance. Therefore, low intrinsic motivation can be a major problem.^[12] This discrepancy is the difference in the statistical population and the sample size of the studies conducted. In the present study, no significant difference was observed in the mean level of extrinsic motivation (introjected regulation) between dental, medical, and pharmaceutical students, in line with the results of Bakhshi et

al.^[7] Students' intrinsic and extrinsic motivation scores were moderate. In a study of Shakibayee et al.^[12] the level of academic motivation in medical students averaged a total score of 35.7, which was slightly higher than average, contrary to the results of the present study. The findings of the present study showed that there was a significant difference in the mean level of motivation between students. The motivation was higher in dental students than in medical, and pharmaceutical students, contrary to the results of Rouhi et al.^[3] The reason for this discrepancy may be due to differences in universities and study samples. In addition, the findings of the present study showed that there was a statistically significant difference in the mean level of academic motivation between dental, medical and pharmaceutical students. The academic motivation in dental and pharmaceutical students was higher than in medical students. These findings were consistent with the results of a study by Naseh et al.^[18] In the study of Rouhi et al.^[3] there was no completely motivated student in terms of academic motivation, and most students (52.5%) were motivated. This finding contradicts the results of the present study. In addition, Saberian showed that nursing students' motivation and the misconception of this profession in the public mind is one of the reasons why students are discouraged from their field, which can adversely affect the quality of education and work of students.^[19] Rouhi et al. showed that students' motivation was 46% moderate and 53.1% higher than moderate.^[20] Examining the study and learning strategies of midwifery students in Mashhad, Khadivzadeh showed that the mean motivation score of these students was 25.6 and reported the lowest level.^[21] The findings of this study showed that there was no direct and significant relationship between intrinsic

motivation and academic achievement between dental, pharmaceutical, and medical students. Based on the findings of this test, a direct and significant relationship was found between the extrinsic motivation of medical students and their academic achievement. According to the findings, there was a significant negative relationship between medical and pharmaceutical students' motivation and academic achievement (GPA). The findings showed a direct and significant relationship between academic motivation and academic achievement of medical students. This finding was consistent with the results of a study by Yousefi et al. They concluded that academic motivation was directly related to the GPA of the basic sciences as well as the overall clinical GPA.^[22] Lanqin Zheng reported that academic motivation and emotion affect self-regulated learning strategies. Self-regulated learning strategies have a positive effect on academic achievement. In addition, academic motivation and emotion are influenced by the mediating effect of self-regulated learning strategies on academic achievement.^[23] These findings were also consistent with the results of Almalki's study. Almalki showed a positive and significant correlation between the mean score of motivation and most of its scales, including self-efficacy of learning performance, control of learning beliefs, and the amount of student work.^[24] In a study of Jamali et al.^[25] the findings showed that the mean total score of educational and learning environments was a maximum of 108.22 and 111.03 in the clinical section, which shows that the optimal threshold in the central section the lowest mean score for social self-understanding was 15.28. The academic atmosphere's highest score was 26.09, while the lowest score was reported in the clinical section. The highest mean scores of 15.81 and 26.5% were related to the same part of the central section. In a study by Khavid et al.^[26] the students' scores on the variables of awareness, attitude towards self-assessment, and attitude were 23.23 ± 3.57 . Evidence-based dental-grade (maximum = 50) was reported to be 48.04 ± 3.35 , and the mean score in female students was higher than in males, and this difference was statistically significant ($P < 0.05$). The mean score of the self-assessment attitude had a significant correlation with the academic year ($P < 0.05$). The component research was low in the relationship between motivation and academic achievement, due to students' accuracy in reporting their GPA. The GPA report may be about the approximate score report, and the decimal values may not be accurate. On the other hand, regarding the high score of interest in homework, it can be said that learners who believe that homework is interesting and valuable are more involved in cognitive activities and use cognitive strategies and monitor more effort. They also have higher academic achievement. One of the limitations of the present study was the time limit for students to participate in the study, which was eliminated by scheduling to complete the questionnaire.

5. Conclusion

The dental, pharmaceutical, and medical students had a moderate level of motivation. Although these students enter the field with relatively acceptable motivation, this motivation decreases over time. Various factors are effective in increasing and decreasing the academic motivation of students that should be identified. Then students should be interested and educated with high motivation by strengthening the positive factors and modifying the factors that reduce motivation. Future studies are recommended to identify the positive factors and to deal with correction and moderation that reduce students' motivation. Additionally, similar studies should be conducted in other faculties of Kermanshah University of Medical Sciences. It is also necessary to conduct a systematic review and meta-analysis to compare academic motivation to reach a general conclusion in this regard.

Conflict of Interest

The authors declared that there is no conflict of interest.

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