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Evaluation of Academic Motivation and Related Factors in Laboratory Science Students of East Universities of Medical Sciences

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Abstract

Background & Objective: Motivation is a basic factor for learning and can affect various behavioral aspects of students in educational environments. This study aimed to explore the academic motivation of laboratory science students in the universities of medical sciences in the East of Iran in 2017.

Materials and Methods: This cross-sectional, descriptive, and analytical study was performed on 334 laboratory science students. Data were collected using an academic motivation scale and a researcher-made questionnaire for factors related to motivation. In addition, data analysis was performed in SPSS using descriptive and analytical statistics, t-test, one-way ANOVA, and Chi-square.

Results: In this study, the mean age of the participants was 20.53±1.57 years, and the mean academic motivation of students was 124.04±18.75 (from a total score of 196). According to the results, there was a significant relationship between academic motivation and the related factors of welfare, education, and future career with the variables of age, gender, and university of study (P≤0.05). Moreover, there was a significant relationship between the intrinsic and extrinsic dimensions of motivation (P≤0.05).

Conclusion: According to the results of the study, the factors of welfare, education, and future career affected the academic motivation of laboratory science students. Therefore, it is suggested that more attention be paid to these factors by the authorities to eliminate barriers to the development of students' motivation.

Introduction

Motivation is an internal process that significantly affects the stimulation, maintenance, and guidance of behavior (1). From weak to strong forms, motivation consists of small scales (e.g., intrinsic and extrinsic motivation and demotivation), in a way that intrinsic motivation is recognized as the strongest form of motivation in strengthening learning and progress (2, 3). Studies show that academic motivation is related to different educational outcomes, namely curiosity, perseverance, and better performance (4). In fact, most innovations, productions, discoveries, and creativities emerge from high motivation and determination (5). In addition, there has been a relationship between learning and motivation in a way that previous knowledge affects the person's motivation (6). As a motivated being, humans need the necessary motivation that fits their activity and work. Learning and education are among the activities of students, and the realization of educational goals requires the necessary motivation in these individuals (7). An individual's motivation decreases when one believes that educational or occupational activities do not meet the needs and goals. This impact is so high that it causes doubt and hesitation about continuing the activity.

Motivation disorders cause behavioral and emotional problems such as pessimism, anxiety, depression, and psychological problems, or significant decline in individual, social, and occupational performance (8), all of which indicate the importance of attention to factors related to academic motivation. Different studies have demonstrated a correlation between academic motivation and various factors such as

demographic characteristics, paternal level of education, welfare, and educational issues, and future jobs (9, 10). For instance, Sanniya Khan Ghauri et al. introduced the job tendency of students as their most important motivational factor (11). Moreover, Miskel et al. found a direct relationship between the presence of one-fourth of students in universities and their current or future occupational status (12). Studies have also emphasized the considerable effect of the university environment on students' motivation (13).

Although some studies have been conducted on academic motivation and related factors in students in Iran (9, 10, 14, 15), the majority of which have reported moderate motivation in students, the high motivation of those studying in health-related disciplines is important not only for the medical community but also for the national future and the health system considering the significant and effective role of these individuals. Therefore, educators and policymakers must take effective steps in this area, using a variety of methods, such as familiarizing professors with different theories of academic motivation and empowering them, in order to increase academic motivation in students (10). The undergraduate course in laboratory sciences is a sub-branch of the medical department that teaches basic medical sciences, practical topics and theories of medical laboratory sciences, and some basic science courses to students. However, this field is especially important due to its significant role in the diagnosis, treatment, prevention, and following up of different diseases. In addition, the considerable role of different laboratory science orientations in significant and increasing advances in biotechnology, genetics, and new diagnostic tests has increased the importance of the discipline. Failure to provide educational programs that fit the health needs of the country will lead to the inability of students in the health system, especially laboratory science students, to raise the society's health to a level that the people could have a productive social and economic life (16).

Recognizing the academic motivation of students and assessing its relationship with other factors (e.g., student welfare of the university, educational welfare of the school and future career) can help universities in defining regulations, providing proper facilities, successfully planning the education of capable students and creating a motivational and joyful academic environment (17). Given the overlooking of the laboratory science field of study, which is one of the most effective fields in the health system of society, in studies performed on the academic motivation of medical students, and with regard to a lack of similar studies on academic motivation of students in universities of medical sciences in the east of the country, and considering the possible relationship between factors such as environmental, educational, welfare and cost-related situations with the academic motivation of students (10), recognizing these effective factors can help regulate and provide appropriate conditions for the authorities. With this background in mind, this study aimed to determine the academic motivation and its associated factors in laboratory science students of universities of medical sciences in the East of Iran.

Materials and Methods

This cross-sectional, descriptive, and analytical research was performed on laboratory science students in 2017 in each medical university in East of Iran based on the division of the Ministry of Health and Medical Education. Sample size was estimated at 384 using the $n=z2p(1-p)/d2$ and considering d=0.05 and P=0.525. The number of students required in each university was determined using stratified random sampling following referring to the education office of universities. The questionnaires were completed by those who passed at least one academic semester. However, 334 out of 400 questionnaires distributed among the participants were completed and returned (response rate=83.5%). Data were collected using a three-section questionnaire: A) demographic characteristics, including age, gender, marital

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status, place of residence and level of education, B) academic motivation, C) related factors including welfare, education, and future career. In addition, data related to the academic motivation of students were gathered applying the English version of the Academic Motivation Scale (AMS), which was originally designed in France entitled EME (18). Notably, the reliability and validity of the mentioned questionnaire have been confirmed in various domestic and foreign studies. This self-determining scale encompasses 28 multiple-choice questions scored based on a seven-point Likert scale from completely agree to completely disagree. The scale assessed three intrinsic (12 items) and extrinsic (12 items) motivation and demotivation (4 items).

Robert Vallerand et al. have also confirmed the validity and reliability of the English version of AMS on Canadian high-school and university students (19). In Iran, the scale's reliability and validity have been assessed in different studies; Mahmoud Bahrani et al. confirmed the face validity of AMS based on the opinions of faculty members of the school of educational sciences, University of Shiraz, and evaluated its reliability using retest. In the end, the scale's reliability was confirmed with a retest of 0.73 with a two-week interval and at a Cronbach's alpha of 0.88. Furthermore, the three dimensions of intrinsic and extrinsic motivation and demotivation were diagramed with a value higher than one by the AMS, thereby confirming the validity and reliability of the scale (20). In 2011, Roshan Milani et al. confirmed the reliability of the tool at a Cronbach's alpha of 0.85 (16). It notable that the scale's total score is 196, and the score ranges of <114, 114-148, and >148 are interpreted as poor, moderate, and high motivation levels, respectively. In addition, the related factors were determined using a researcher-made questionnaire and based on a study by Rouhi et al. (21). This 27-item multiple-choice questionnaire is scored based on a five-point scale from completely agree to completely disagree. Moreover, the questionnaire consisted of three sections (students' welfare, education in the school, and future career), each containing nine items. The scientific credibility of the questionnaire was confirmed by content validity and its scientific reliability was determined by Rouhi et al. at the Cronbach's alphas of 0.81, 0.82, and 0.92 for the dimensions of students' welfare, education, and future career, respectively. In addition, the score ranges of 9-16, 16-23, 23-30, 30-37, and 37-45 were indicative of complete dissatisfaction, dissatisfaction, moderate satisfaction, satisfaction, and complete satisfaction, respectively.

Notably, the present study was approved by the vice-chancellor for research and technology and the ethics committee of Birjand University of Medical Sciences (code of ethics: IR.BUMS.REC.1395.119) (1395.08.10). In addition, informed consent was obtained from the participants prior to the research, and they were ensured of the confidentiality terms regarding their personal information. Furthermore, the necessary explanations regarding the method of completing the questionnaires were provided to the subjects and sufficient time was given for a better understanding of the questions. Data analysis was performed in SPSS version 19 using descriptive-analytical statistics, Pearson's correlation coefficient, independent t-test, and one-way ANOVA. It is noteworthy that a P-value of less than 0.05 was considered statistically significant.

Results

In this study, the mean age of the participants was 20.53±1.57 years. In addition, most subjects were single (81.7%) and female (66.5%) and were residing in the university's dormitories (52.7%). Moreover, the majority of the participants were below the age of 20. The students assessed were from the universities of Mashhad (14.97%), Shahroud (11.68%), Bojnurd (11.98%), Gonabad (5.99%), Sabzevar (8.38%), Torbat-e Heydarieh (9.88%), Birjand (14.37%), Zahedan (12.28%), and Zabol (10.48%). The mean academic motivation score of the participants was estimated at 124.04±18.75 out of a total score of 196, showing that most students had a moderate level of motivation (74.3%) (Table 1).

Table 1: The Frequency of students according to the level of academic motivation.

The level of academic motivation	No.	Percent
Strong	48	14.4
Moderate	248	74.3
Weak	38	11.4
Total	334	100

In addition, the mean scores of intrinsic and extrinsic motivation and demotivation were reported to be 54.66±8.24 (out of a maximum score of 84), 53.39±10.48 (out of a maximum score of 84) and 15.97±2.9 (out of a maximum score of 27), respectively.

In addition, the mean scores of the factors related to students' welfare, education, and future career were estimated at 26.04±6.1, 25.07±6.98, and 22.58±6.76, respectively (out of a maximum score of 45 for each factor). In addition, 48.5% and 34.7% of the participants were moderately satisfied with welfare and education factors, respectively, whereas 42.5% of the subjects were dissatisfied with their future careers (Table 2).

Table 2: The Frequency of students according to the level of satisfaction with academic motivation related factors.

	Welfare		Education		Future career	
	No.	**Percent**	**No.**	**Percent**	**No.**	**Percent**
Completely satisfied	11	3.3	15	4.5	8	2.4
Satisfied	54	16.2	63	18.9	35	10.5
Moderate	162	48.5	116	34.7	92	27.5
Dissatisfied	87	26	101	30.2	142	42.5
Completely dissatisfied	20	6	39	11.7	57	17.1
Total	334	100	334	100	334	100

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According to the results, there was a significant relationship between the academic motivation of students and their age range (P≤0.05), meaning that the motivation of students decreased by aging. Moreover, a significant difference was observed between the academic motivation of students and the variables of gender and university of study (P≤0.05). On the other hand, no significant difference was observed between the academic motivation of students and variables of marital status, place of residence, and academic semester (P≥0.05) (Table 3).

Table 3: Comparison of the mean academic motivation of students according to the demographic and educational variables.

Variable		Mean	Standard deviation	Statistical tests result
Gender	Male	117.75	20.74	t=-4.475
	Female	127.21	16.85	Df=332
				P=0.004
Age categories	Under 20 years	125.92	17.75	F=3.31
	Between 20 – 22 years	123.15	19.76	Df=2
				P=0.03
	Over 20 years	117.71	19.29	
Marital status	Single	124	18.51	t=-0.73
	Married	124.9	19.95	Df=332
				P=0.59
Residency	Dormitory	124.32	20.66	t=-0.298
	Non-dormitory	123.71	16.43	Df=332
				P=0.76
Academic term	1	128.06	17.31	
	2	122.04	23.77	F=0.648
	3	125.03	16.47	Df=333
	4	122.93	14.63	P=0.69
	5	122.4	20.8	
	6	124.4	12.11	
	7	122.39	19.55	

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Furthermore, a significant correlation was detected between the academic motivation of students and related factors of students' welfare, education, and future career (Table 4).

Table 4: Relationship between academic motivation with welfare, educational and future career factors of students.

	Welfare	Education	Future career	Intrinsic motivation	Extrinsic motivation
Academic motivation	r=-0.239 P=0.001	r=-0.279 P=0.001	r=-0.5 P=0.001	r=0.943 P=0.001	r=0.950 P=0.001
Intrinsic motivation	r=-0.198 P=0.001	r=-0.246 P=0.001	r=-0.439 P=0.001	–	r=0.833 P=0.001
Extrinsic motivation	r=-0.257 P=0.001	r=-0.284 P=0.001	r=-0.54 P=0.001	r=0.833 P=0.001	–

It is notable that the data related to the demographic variables of age and semester groups and data related to the academic motivation of students had a normal distribution, for which we applied the non-parametric ANOVA test.

Discussion

In the present study, most students (74.3%) had a moderate level of academic motivation, which is consistent with the results of some studies performed on the academic motivation of students in Iran (9, 10, 16, 21). Meanwhile, moderate and good motivation levels were detected in students in studies performed by Izadi (22) and Rouhi (23) at the University of Golestan and by Sharififard (24) and Tamanaeifar (25) in the universities of Qom and Kashan, respectively. According to the results of the current research, the mean scores of intrinsic (54.66±8.24) and extrinsic (53.39±10.48) motivation of students were higher than the mean score, which is in line with other studies conducted on the academic motivation of students (9, 23, 26). In contrast, Kumru Didem Atalay et al. (27) reported a low level of intrinsic (4.29±17.72) and extrinsic (18.76±3.98) motivation in medical students of Baskent University. On the other hand, only 0.7% of the students assessed in the study by Roshan Milani (16) were demotivated, and no student was demotivated in the research by Rouhi et al. (21).

In the present study, the mean score of students' demotivation was reported to be 15.97±2.9 out of 27. Basically, laboratory science students should not be completely demotivated after being accepted in the nationwide university entrance exam, which is intense competition. Therefore, this high score of demotivation among these individuals was considerable. However, it should be pointed out that the participants in the aforementioned studies were selected from all medical students, whereas our subjects were selected only from the laboratory science students. In this regard, Izadi (22) marked a lower academic motivation level in the laboratory science students, compared to students of other fields, such as nursing, operating room, and anesthesiology. This low motivation level in laboratory science students might be due to

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comparing oneself with students in other disciplines. Research shows that 76% of these students and 69% of students in other fields of study have a negative attitude toward the field of laboratory sciences (28, 29). The results were indicative of a significant relationship between the academic motivation of students and the variables of age (P=0.03), gender (P=0.00), and university of study (P=0.00). In other words, academic motivation was higher in female students, compared to male students, which is consistent with the results obtained by Izadi (22) but inconsistent with the results of Rouhi (21).

In the current research, the students' academic motivation level decreased by aging. According to Kosgeroglu (30), students' academic motivation decreased with moving on to the next semester, and aging mainly because their knowledge of professional issues increased over time. In addition, the interest of some students (e.g., nursing students) to their field of study increased with the increase of the academic semester due to being more familiarized with their field of work and clinic. This issue might be overlooked in laboratory science students, which requires more assessments. In the present study, motivation increased in sixth-semester students but decreased in seventh-semester students, which seemed to be due to the start of the internship course and a new experience of working in a laboratory with the constant supervision of the lab's specialist and professor, which more familiarizes students with the hardship and difficulties of lab work.

In the present research, there was a significant correlation between four factors related to the academic motivation of students and their academic motivation and its intrinsic and extrinsic components. In other words, the lower the factors of students' welfare, education, and future career, the higher their academic motivation, especially extrinsic motivation. This increase of motivation, which was inconsistent with some studies (10, 21), might be due to lack of considering the mentioned factors in selecting the field of laboratory sciences and only selecting this discipline out of desperation and because of a lack of a proper field based on the score obtained in the nationwide university entrance exam (29). Therefore, these students preferred studying in a more suitable field in a university with lower educational and welfare facilities. In a research, Kim et al. reported a relationship between learning strategies and motivation with the academic achievement goals of students (31). Overall, 142 participants (42.5%) were dissatisfied with their future career, and 57 subjects (17.1%) were completely dissatisfied with this issue. Meanwhile, studies show that occupational motivation is a key factor in the continuation of efficient employment (32). The main mission of the laboratory science discipline is to train people who can perform various tests on the blood or other fluids and tissues of the body in the clinical laboratories of hospitals and laboratories of health centers with the special knowledge they have acquired and by using sophisticated electronic devices and various methods of experiments. These qualifications will not be acquired unless these individuals have the necessary motivation to learn the skills. Notably, a part of the motivation is created as a result of satisfaction with the field and a guaranteed future career. One of the basic strategies to prevent this decrease in motivation is to inform, heighten awareness, and enhance the attitude of individuals through mass media, as well as to inform physicians about the scope of duties and activities of laboratory science experts and their place in the healthcare system.

One of the major drawbacks in the present study was the lack of cooperation of some of the participants in completing the questionnaires or the geographical distance from the universities, which was out of the control of the researcher. Therefore, it is suggested that similar studies be performed using more sophisticated tools such as interviews or qualitative approaches.

Conclusion

Given the relationship between academic motivation and related factors of students' welfare, education, and future career, and with regard to the moderate academic motivation of

students, the authorities are obligated to focus on this issue to take a step toward the flourishing and growth of students through increasing motivation in these individuals and eliminating barriers to the factors enhancing motivation in students.

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

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