

A Cross-Sectional Study of The Background Factors Associated With Academic Motivation Upon Admission To A Medical School in Japan

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Abstract

Background

To become a doctor with a high level of professionalism and ethical standards, it is important to have and maintain a high level of motivation from the time of admission to medical school. However, no studies in Japan have quantitatively investigated the factors related to motivation immediately after enrollment. In this study, we identified the background factors that influence the motivation of medical students immediately after admission.

Methods

A cross-sectional study was conducted. First-year medical students answered our questionnaire three weeks after admission. The questionnaire comprised 16 demographic items, and the 28-item Academic Motivation Scale was used to quantify motivation.

Results

Our analysis showed that amotivation, representing low self-determinant motivation, was significantly higher in students whose parents were medical professionals and in students who did not talk about their problems than in those whose parents were not medical professionals and those who did talk about their problems, respectively. Intrinsic motivation, which indicates the level of self-determinant motivation, was significantly lower in students who belonged to a sports club.

Conclusions

No previous studies have suggested that having parents who are medical professionals might be a factor associated with their children's decreased motivation when entering medical school in Japan. However, further research is needed to analyze this relationship.

Introduction

Physicians are expected to have a high level of professionalism.^{1,2} Professionalism includes behaving ethically and being impartial and honest with patients. To achieve these goals, it is necessary to maintain a high level of motivation and constantly develop one's abilities. All medical school faculty members are responsible for selecting highly motivated students and training them, leading to an increase in well-trained medical professionals. Furthermore, this is the first step toward contributing to the improvement of patient outcomes in medical care.

The importance of motivation has been discussed for decades, and the quality of motivation has been found to affect patient outcomes, the academic performance of students, well-being during school, and professional identity.^{3,4} Previous research on the motivation of medical students has identified various factors influencing it.^{5,6} However, few studies have explored the correlations between motivation and background factors immediately after medical school enrollment.⁷ Therefore, this study clarified the factors that influence motivation at the time of admission to medical school.

Methods

Design

This cross-sectional study investigated the relationship between individual backgrounds and motivation among medical students at their enrollment.

Japanese medical education

In Japan, most medical school candidates are high school students. A small number of students re-enter university after having graduated from another university or after having worked. In addition, Japanese medical schools have certain reserved spaces called regional quotas to secure human resources to eliminate the uneven geographical distribution of physicians. Newly graduated physicians who are a part of the regional quota are required to devote themselves to local community medicine for a set number of years.

Participants

A questionnaire survey was conducted among medical students one month after their admission to Shimane University. Shimane University is a national university in relatively rural Japan, and its academic level of admission is near the average of Japanese medical schools. The inclusion criteria were defined as those who responded to the questionnaire and had no missing data. The exclusion criteria were those who did not consent to the questionnaire, did not respond, whose mark sheets could not be read by the machine, or whose responses were insufficient for analysis.

Sample size

The sample size ($N = 81$) was calculated by considering the following assumptions: total student number ($N = 103$), the 95% confidence level, margin of error ($d = 5\%$).

Ethical standards

We conducted this study under the condition that the information obtained would be used solely for this study, following the ICMJE requirements on privacy and informed consent from study participants and the Personal Information Protection Law in Japan. It is completely anonymized and cannot be used to identify individuals. Therefore, after consulting with the IRB in Shimane University Hospital, we omitted approval from the Ethical board. We also explained they were free to refuse to participate, their

participation or refusal would be unknown to their instructors, and there would be no negative consequences to their standing in the program or university if they failed to participate.

Measures

In the questionnaire, we investigated respondents' background factors and motivation. The background factors included age, gender, the experience of failing or waiting for the entrance examination, hometown, whether they gained entrance as part of a regional quota, whether they have parents who are medical professionals, scholarship and its classification on their entrance permission, extracurricular activities, smoking habits, average hours of sleep, breakfast habits, time spent working part-time during the week, what matters in daily life, concerns, and whether they have someone to talk to about their problems (Appendix 1).

We used the Academic Motivation Scale (AMS) to evaluate motivation, quantifying the extensively studied self-determination theory (SDT).^{5,8} The AMS is an SDT-based questionnaire developed in France to measure motivation. It was translated into English in 1992 and has been shown to be valid and appropriate.⁹ The AMS classifies motivation into three categories: Intrinsic Motivation (IM), Extrinsic Motivation (EM), and Amotivation.

IM refers to the pleasure or satisfaction one derives from working on an object for its own sake. IM can be further divided into three categories: IM-to know, IM-to accomplish, and IM-experience. IM-to know refers to the pleasure one feels in learning, exploring, or trying to understand something new. IM-to accomplish refers to the satisfaction one feels in trying to accomplish or create something. IM-experience describes the state of participating in an activity to experience the stimulating sensations that result from that activity.

EM is further divided into three categories: EM-identified, EM-introjected, and EM-externally regulated. EM-identified refers to the state in which people judge the value and importance of an object and choose it for themselves. In contrast, EM-introjected refers to the state in which people begin to internalize the object based on past experiences, and EM-externally regulated refers to the state in which the reason for doing something is externally controlled.

Unlike the above two types of motivation, amotivation is a state of not finding a connection between the target and one's own behavior. The higher the value of amotivation, the less motivation one has for the issue at hand. These motivation elements are hierarchical in SDT, with amotivation being the most non-self-determined state, followed by EM-externally regulated, EM-introjected, EM-identified, and IM (Fig. 1).¹⁰ SDT states that IM and EM-identified positively affect academic performance and well-being, while high non-self-determined motivations, such as amotivation, have a negative impact.³

The AMS is divided into seven subscales (three IM, three EM, and one amotivation) as described above, which are evaluated with 28 question items. Four questions are assigned to each subscale in a random order, and each question is answered on a seven-point scale. The questions in the AMS translated into

Japanese were used in this study. The translated Japanese questions were back-translated using Google Translate to ensure that the content was completely understandable (March 7, 2021). A reliability test of the AMS used in this study showed that it had a Cronbach's alpha of 0.84, indicating that the results of this questionnaire were highly reliable.

Procedure

On May 8, 2019, the survey was administered before the liberal arts class on ethics and professionalism. The questionnaire was distributed to the class, and the students were informed that submitting the questionnaire was not mandatory and that the submission and their answers would have no effect on their grades. In addition, we explained that this was an anonymous survey and how to handle personal information.

We used response sheet card for the questionnaire and collected them after the class. The faculty of the academic affairs division used a read-only machine to scan the mark sheets. They sent personal information in the format of a .csv file without being linked to the analyst, and we analyzed the data. As described above, we were allowed to omit the Ethics Committee review because only participants whose consent could be obtained were included, anonymity was ensured, there were no particular harmful effects, and the content was within the scope of our daily educational work to improve medical education.

Data analysis

Chi-square tests or Fisher's exact tests were used to compare nominal variables. For continuous variables, *t*-tests or Wilcoxon rank-sum tests were used as appropriate with Cohen's *d* being used to estimate the effect size of score differences.¹¹ For multiple logistic analysis, we incorporated several important factors that were likely to be significant ($p < .10$), and several items suggested to be important by previous studies, avoiding multicollinearity: gender, age, recommended admission, receiving a scholarship, parents are medical professionals, an absence of concerns, not having someone to talk to about one's problems, and belonging to an athletic club. None of the variance inflation factor values exceeded 10, and the mean VIF of the model was less than 1.27. All analyses were performed using the Stata statistical software, version 14.0 (Stata Corp. 2015, Stata 14 Base Reference Manual). All tests were two-sided, with $p < .05$ being considered statistically significant.

Results

A total of 103 medical students participated in the class (100% of the total number of students), and 96 responded (93.2% of the total number of students). Altogether 81 questionnaires (78.6%) with consent were collected and analyzed in accordance with the exclusion criteria described previously. Table 1 shows the participant characteristics. About 40% of the students were female, and one in five were students who re-enrolled after graduating from another school. More than 80% of the students belonged to athletic teams, and less than 40% had parents in the medical profession. More than 80% of the students had

some problems with their school life; however, more than one in six students did not discuss their problems with others.

Table 2 shows the overall results of the AMS. The mean of amotivation was 6.84 ($SD = 4.84$). Among IMs, the value of IM-to know was the highest. The value of EM-identified, which is the most self-identified motivation among EMs, was the highest.

Tables 3 and 4 show the results of the multivariate linear analysis adjusted for the total value of amotivation and IM.

Background factors selected for amotivation values were analyzed similarly. Only two background factors were significantly correlated with higher amotivation scores: having a parent in the medical profession ($\beta = 2.536$, 95% CI [0.277, 4.795]) and not having anyone to talk to about problems ($\beta = 3.280$; 95% CI [0.494, 6.067]).

Being a member of an athletic club had a significant impact on the total IM ($\beta = -.329$, 95% CI [-18.16, -0.497]). This suggests that belonging to an athletic club during the first three weeks of school had a negative impact on IM. The other background factors were not statistically significant after adjustment.

These results suggest that belonging to an athletic club, having a parent in the medical profession, and a tendency to not talk about one's problems were correlated with the inability to maintain self-determinant motivation. In contrast, none of the other factors, such as gender, age, retake status, hometown, or scholarship, were significantly correlated with motivation values.

Analysis of the factors that seem to affect AMS

Table 5 shows the comparison of AMS values for the three factors that seem to affect AMS as a result of the multivariate analysis. A comparison of the AMS of students who belonged to an athletic club with that of those who did not indicate a significant difference in the total value of IM (mean total value of IM in the athletic club: 54.22 vs. 63.00 in the non-athletic club group, $p = .041$). In addition, the mean IM-experience was significantly lower (mean IM-experience in the athletic group: 15.12 vs. 19.69 in the non-athletic group, $p = .006$). There were no statistically significant differences between the other items.

Regarding the AMS for students whose parents are medical professionals, their amotivation value was significantly higher (mean value of 8.41 vs. 5.96 for the group of students whose parents are not, $p = .0058$). As for other AMS values, IM-to know was significantly lower in the group with parents who are medical professionals (mean value of 20.88 vs. 23.00 for the group whose parents are not, $p = .0166$). There were no significant differences between the other values.

The results of the AMS comparison between the group who did not talk about their problems with others and the other group showed that the amotivation value was significantly higher in the group who did not

discuss their problems (mean amotivation value of 9.50 vs. 6.28 in the other group, $p = .039$). There were no significant differences between the other values.

Discussions

The purpose of this study was to examine the background factors associated with the motivation of medical students at the time of admission. Our primary results were threefold. First, students who belonged to an athletic club had a lower IM, especially IM-experience, than those who did not. Second, students whose parents were medical professionals had higher amotivation and lower IM-to-know than students whose parents were not medical professionals. Third, students who do not discuss their problems with others had higher amotivation than students who did discuss their problems. These three factors and motivation are correlated, indicating that each of these three factors decreased self-determinant motivation. In contrast to previous studies, other background factors, such as age and gender, were found to have limited correlations with motivation at the time of enrollment.^{5,7,12}

The reasons why students whose parents are medical professionals have high non-self-determinant motivation are as follows. Such students are expected since childhood to take over family-owned hospitals or clinics later in life, and they see their parents working as medical professionals, which may lead to them experiencing high external motivation. Previous studies have not pointed out that the lower motivation of medical students is linked to the fact that their parents are medical professionals. In Japan, there is a large difference between the tuition fees of public medical schools (flat payment, about 3.5 million yen for 6 years) and that of 31 private medical schools (median: 34,096,000 yen, minimum: 19,100,000 yen, maximum: 47,365,000 yen). The parents of many students in private medical schools are doctors. Since this survey was conducted at a public university, it is probable that these factors may be related to the difference in parents' financial ability; thus, a multi-center survey is needed in the future.

Next, we examined why students who do not discuss their problems with others have high levels of non-self-determinant motivation. There are three possible reasons students do not tell anyone about their problems. First, they have no one to talk to; second, they solve their problems by themselves; and third, they cannot solve their problems, and hence, the problems accumulate. Previous studies have shown that students who lacked support from their peers tend to be depressed.^{13,14} In addition, medical students with depressive tendencies have been shown to have predominantly higher amotivation, consistent with our results.^{15,16} Interventions for this situation have been studied, and we hope that early detection and intervention can improve medical students' motivation.¹⁷

Finally, we discuss the cause of the low self-determinant motivation of students belonging to an athletic club. It has been shown that exercise can improve academic performance and mental health.^{18–22} However, few previous studies have described the relationship between belonging to an athletic club and motivation at the time of entrance. In addition, when the students have joined an athletic club just after entering school, the effects of exercise, as shown in previous studies, may not be obtained. The 'act' of belonging to an athletic club may be correlated with motivation. To the best of our knowledge, none of

the previous studies have shown a correlation between belonging to an athletic club at the time of admission and motivation or academic performance, so we believe this to be a new finding in regard to Japanese medical schools.

Limitations

This study had several limitations that merit noting. First, it was a single-center study in Japan, and therefore, it cannot be generalized to medical students in all countries. Second, we could not specify the parents' occupation, only whether their occupation was as a medical professional, and the results may differ depending on the type of medical role. The third point is that the AMS is based on the Japanese translation of the English questionnaire, and we could not verify whether the AMS can be validated in the Japanese education system, although we have conducted back-translation. However, to the best of our knowledge, this is the first study conducted in Japan using the AMS to assess medical students' motivation at the time of admission, and we believe it will be a fundamental pilot study in Japan.

Conclusions

Our study showed that students whose parents are medical professionals and do not discuss their problems with others are associated with lower motivation when admitted to medical school. Further research is needed to determine whether these results are applicable to other universities and countries and clarify the factors that influence motivation at the time of medical school enrollment.

List Of Abbreviations

AMS	
Academic Motivation Scale	
EM	
extrinsic motivation	
IM	
intrinsic motivation	
SDT	
self-determination theory	
VIF	
variance inflation factor	

Declarations

Ethical Approval and Consent to Participate

We obtained the informed consent from the participants under the condition that the information obtained would be used solely for this study, in accordance with the ICMJE requirements on privacy and informed consent from study participants and the Personal Information Protection Law in Japan,

and with the Helsinki Declaration of 1965, as revised in 2013 in Brazil. Our study data was completely anonymized, cannot be used to identify individuals, and no more than minimal risk. Hence, we approval by the Ethics Committee of Shimane University Hospital was omitted.

Consent for Publication

Not applicable.

Data availability statement

Raw data were generated at Shimane University. Derived data supporting the findings of this study are available from the corresponding author T.W. on request.

Competing interests

The authors declare that they have no competing interests.

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Author contributions

NN and TW designed the study, the main conceptual ideas, and proof outline. NN and TW analyzed all the data. KK supported the writing of the manuscript, and KO supported data collection. TW supervised all the processes. All authors discussed the results and commented on the manuscript. All authors read and approved the final manuscript.

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KO is a professor and dean of the faculty of medicine at Shimane University, Japan. As a leader, he works to reform medical education pre- and post-graduation. As a business person, he is highly regarded for his exceptional leadership and management skills in Japan's medical education field.

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References

1. American Medical Association. AMA Declaration of Professional Responsibility: Medicine's social contract with humanity. American Medical Association. 2001. <https://www.ama-assn.org/delivering-care/public-health/ama-declaration-professional-responsibility>. Accessed 25 Mar 2021.
2. ABIM Foundation [American Board of Internal Medicine], ACP-ASIM Foundation [American College of Physicians-American Society of Internal Medicine], European Federation of Internal Medicine. Medical professionalism in the new millennium: A physician charter. *Ann Intern Med*. 2002;136(3):243–6. doi: 10.1016/s0029-7844(02)02082-3
3. ten Cate TJ, Kusurkar RA, Williams GC. How self-determination theory can assist our understanding of the teaching and learning processes in medical education. *AMEE Guide No. 59. Med Teach*. 2011;33(12):961–73. doi: 10.3109/0142159X.2011.595435.
4. Wasityastuti W, Susani YP, Prabandari YS, Rahayu GR. Correlation between academic motivation and professional identity in medical students in the Faculty of Medicine of the Universitas Gadjah Mada Indonesia. *Educ Medica*. 2018;19(1):23–9. doi: 10.1016/j.edumed.2016.12.010.
5. Kusurkar RA, ten Cate TJ, Vos CM, Westers P, Croiset G. How motivation affects academic performance: A structural equation modelling analysis. *Adv Health Sci Educ Theory Pract*. 2013;18(1):57–69. doi: 10.1007/s10459-012-9354-3.
6. Orsini C, Binnie VI, Wilson SL. Determinants and outcomes of motivation in health professions education: a systematic review based on self-determination theory. *J Educ Eval Health Prof*. 2016;13:19. doi: 10.3352/jeehp.2016.13.19.
7. Kusurkar R, Kruitwagen C, ten Cate O, Croiset G. Effects of age, gender and educational background on strength of motivation for medical school. *Adv Health Sci Educ Theory Pract*. 2010;15(3):303–13. doi: 10.1007/s10459-009-9198-7.
8. Kusurkar RA, ten Cate TJ, Van Asperen M, Croiset G. Motivation as an independent and a dependent variable in medical education: a review of the literature. *Med Teach*. 2011;33(5):e242-62. doi:

9. Vallerand RJ, Pelletier LG, Blais MR, Briere NM, Senecal C, Vallieres EF. The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educ Psychol Meas.* 1992;52(4):1003–17. doi: 10.1177/0013164492052004025.
10. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000;55(1):68–78. doi: 10.1037/0003-066X.55.1.68.
11. Russell V Lenth (2001) Some Practical Guidelines for Effective Sample Size Determination, *The American Statistician*, 55:3, 187–193, DOI: 10.1198/000313001317098149
12. Tanaka M, Mizuno K, Fukuda S, Tajima S, Watanabe Y. Personality traits associated with intrinsic academic motivation in medical students. 2009;43(4):384–7. doi: 10.1111/j.1365-2923.2008.03279.x.
13. Jeong Y, Kim JY, Ryu JS, Lee KE, Ha EH, Park H. The associations between social support, health-related behaviors, socioeconomic status and depression in medical students. *Epidemiol Health.* 2010;32:e2010009. doi: 10.4178/epih/e2010009.
14. Silva AG, Cerqueira AT de AR, Lima MCP. 2014. Apoio social e transtorno mental comum entre estudantes de Medicina [Social support and common mental disorder among medical students]. *Rev Bras Epidemiol.* 2014;7(1):229 – 42. Portuguese. doi: 10.1590/1415-790X201400010018ENG.
15. Park J, Chung S, An H, Park S, Lee C, Kim SY, et al. A structural model of stress, motivation, and academic performance in medical students. *Psychiatry Investig.* 2012;9(2):143–9. doi: 10.4306/pi.2012.9.2.143.
16. Yamada Y, Klugar M, Ivanova K, Oborna I. Psychological distress and academic self-perception among international medical students: the role of peer social support. *BMC Med Educ.* 2014;14(1):256. doi: 10.1186/s12909-014-0256-3.
17. Xu YY, Wu T, Yu YJ, Li M. A randomized controlled trial of well-being therapy to promote adaptation and alleviate emotional distress among medical freshmen. *BMC Med Educ.* 2019;19(1):182. doi: 10.1186/s12909-019-1616-9.
18. Babenko O, Mosewich A. In sport and now in medical school: examining students' well-being and motivations for learning. *Int J Med Educ.* 2017;8:336–42. doi: 10.5116/ijme.59b7.8023.
19. Giacobbi PR Jr, Tuccitto DE, Frye N. Exercise, affect, and university students' appraisals of academic events prior to the final examination period. *Psychol Sport Exerc.* 2007;8(2):261–74. doi: 10.1016/j.psychsport.2006.04.001.
20. Lee KP, Yeung N, Wong C, Yip B, Luk LH, Wong S. Prevalence of medical students' burnout and its associated demographics and lifestyle factors in Hong Kong. *PLoS One.* 2020;15(7): e0235154. doi: 10.1371/journal.pone.0235154.
21. Macky D, Dong T, Torre D, Schreiber-Gregory D, Singaraju R, Durning SJ. The association with physical fitness and academic performance at America's military medical school. *Mil Med.* 2021;186(1–2):112–8. doi: 10.1093/milmed/usaa251.

22. Stephens MB, Dong T, Durning SJ. Physical fitness and academic performance: a pilot investigation in USU medical students. *Mil Med.* 2015;180(Suppl 4):77–8. doi: 10.7205/MILMED-D-14-00559.

Tables

Table 1
Characteristics of participants (N = 81)

Characteristic	n	%
Gender		
Male	48	59.3
Female	33	40.7
Median age (IQR)	19 (18, 21)	
Mean age (SD)	21 (4.37)	
Experience of failing or waiting for the entrance examination		
None	32	39.5
One year	33	40.7
More than one year	13	16.1
Re-entrance after graduating from another university	7	8.6
Re-entrance after working	11	13.6
Duty to work at Shimane prefecture	18	22.2
Coming from Shimane prefecture	25	30.9
Receiving a scholarship	35	43.2
Experience with smoking	9	11.1
Belonging to an athletic club	68	84.0
Parents in the medical profession	29	35.8
Duration of sleep		
< 6 hours	5	6.2
6–7 hours	37	45.7
7–8 hours	31	38.3
> 8 hours	8	9.9
Breakfast habits		
≥ 5 days per week	63	77.8
≤ 4 days per week	18	22.2
Recommended admission	33	40.7

Characteristic	n	%
Working at a part-time job > 10 hours per week	6	7.4
What is important		
Family	26	32.1
Friends	18	22.2
Grade	12	14.8
Others	25	30.9
Concerns about campus life		
Grade	29	35.8
Financial	11	13.6
Nothing	14	17.3
Other	27	33.3
A partner whom you can consult		
Friends	42	51.9
Family	19	23.5
Do not discuss with others	14	17.3
Other	6	7.4

Table 2
Results of the Academic Motivation Scale (N = 81)

	M (SD)	Median (IQR)
Amotivation	6.84 (4.85)	5 (4–8)
Total Intrinsic Motivation	55.63 (12.26)	56 (49–63)
IM– To Know	22.21 (4.61)	23 (20–25)
IM– To Accomplish	17.57 (5.11)	18 (14–21)
IM– Experience	15.85 (4.77)	16 (13–19)
EM– Identified	24.09 (4.20)	25 (22–27)
EM– Introjected	13.67 (5.4)	14 (10–17)
EM– Externally Regulated	19.07 (6.21)	20 (16–24)

Table 3
Results of the multiple linear regression for amotivation (N = 81)

	β	SE	t	95% CI		p
Gender (Male)	0.68	1.14	0.59	-1.59	2.94	.554
Over 24 years old	2.04	1.71	1.19	-1.37	5.46	.236
Recommended admission	-0.79	1.22	-0.65	-3.22	1.63	.517
Receiving a scholarship	-0.16	1.09	-0.01	-2.19	2.16	.988
Parents in the medical profession	2.54	1.13	2.24	0.28	4.80	.028
No concerns about campus life	0.04	1.37	0.03	-2.69	2.76	.979
Do not discuss with others	3.28	1.40	2.35	0.49	6.07	.022
Belonging to athletic club	3.07	1.69	1.82	-0.30	6.44	.073
Note. Higher amotivation values indicate lower motivation.						

Table 4
Results of the multiple linear regression for total Intrinsic Motivation (N = 81)

	β	SE	t	95% CI		p
Gender (Male)	-0.29	2.98	-0.10	-6.22	5.65	.924
Over 24 years old	-3.28	4.49	-0.73	-12.23	5.67	.467
Recommended admission	-1.33	3.39	-0.42	-7.69	5.02	.677
Receiving a scholarship	2.22	2.86	0.78	-3.48	7.92	.440
Parents in the medical profession	-4.56	2.97	-1.53	-10.48	1.37	.129
No concerns about campus life	0.89	3.58	0.25	-6.25	8.03	.804
Does not discuss with others	0.55	3.66	0.15	-6.76	7.85	.882
Belonging to athletic club	-9.33	4.43	-2.11	-18.16	-0.50	.039

Table 5

Difference in academic motivation score between students who are subject to three influential factors on academic motivation score and the other students (N = 81)

Parents in the medical profession	Medical Profession (n = 29)	Other Students (n = 52)	p-value
	Mean (SD)	Mean (SD)	
Amotivation	8.41 (5.81)	5.96 (4.01)	.006
Total Intrinsic Motivation	52.14 (12.87)	57.58 (11.58)	.052
IM–to know	20.83 (4.92)	22.98 (4.29)	.017
IM–to accomplish	16.59 (5.13)	18.12 (5.06)	.127
IM–experience	14.72 (4.43)	16.48 (4.88)	.151
EM–identified	20.21 (5.92)	18.44 (6.33)	.291
EM–introjected	14.59 (5.51)	13.15 (5.47)	.379
EM–externally regulated	23.34 (4.97)	24.50 (3.69)	.352
Does not discuss problems with others	Not Discussed (n = 14)	Other Students (n = 67)	p-value
	Mean (SD)	Mean (SD)	
Amotivation	9.50 (7.23)	6.28 (4.04)	.039
Total Intrinsic Motivation	56.79 (12.49)	55.39 (12.29)	.736
IM–to know	22.00 (5.04)	22.25 (4.56)	.900
IM–to accomplish	18.36 (5.96)	17.40 (4.95)	.499
IM–experience	16.43 (4.86)	15.73 (4.78)	.861
EM–identified	20.64 (5.75)	18.75 (6.29)	.263
EM–introjected	14.29 (5.28)	13.54 (5.57)	.822
EM–externally regulated	22.86 (3.35)	24.34 (4.33)	.067
Belongs to athletic club	Athletic club (n = 68)	Other students (n = 13)	p-value
	Mean (SD)	Mean (SD)	
Amotivation	7.15 (5.13)	5.23 (1.77)	.240
Total Intrinsic Motivation	54.22 (11.78)	63.00 (12.56)	.041

Parents in the medical profession	Medical Profession (n = 29)	Other Students (n = 52)	p-value
	Mean (SD)	Mean (SD)	
IM– To Know	21.84 (4.77)	24.15 (3.18)	.201
IM– To Accomplish	17.26 (5.02)	19.15 (5.46)	.243
IM– Experience	15.12 (4.39)	19.69 (5.02)	.006
EM– Identified	24.01 (4.38)	24.46 (3.23)	.979
EM– Introjected	13.93 (5.35)	12.31 (6.24)	.197
EM– Externally Regulated	19.04 (6.29)	19.23 (6.04)	.985

Additional Files

Additional Files are not available with this version

Figures

Behaviour	Nonself-Determined ↔ Self-Determined				
Type of motivation	Amotivation	Controlled motivation		Autonomous Motivation	
Type of regulation	No regulation	External	Introjected	Identified	Intrinsic
AMS Motivation Type	Amotivation	Extrinsic Motivation			Intrinsic Motivation
AMS Name	Amotivation	EM - Externally regulated	EM - Introjected	EM - Identified	IM - to know IM - to accomplishment IM - experience

Figure 1

Classification of motivation in the Self-Determination Theory