ORIGINAL ARTICLE

Role of Personality Trait, Age, and Year of Study as Predictors of Academic Motivation in Students of a Private Sector Medical College: A Cross-Sectional Study

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ABSTRACT

Objective: This study aimed to determine the effect of age, academic year, and personality traits on academic motivation.

Study Design: Cross-sectional study.

Place and Duration of Study: The study was conducted at the Department of Community Medicine, Lahore Medical and Dental College (LMDC), Lahore, Pakistan, from May 2024 to October of 2024.

Methods: The study comprised 616 undergraduate MBBS students, using a convenience sample. A questionnaire comprising the Academic Motivation Scale, named as AMS-28, the Ten-Item Personality Inventory, and the sociodemographic profile was used to gather data. A seven-point Likert scale, with 1 denoting "strongly disagree" and 7 denoting "strongly agree," was used to rate each item in parts 2 and 3 of the questionnaire. To analyse the data, SPSS version 22 was used. Mean scores, frequency, and percentage were calculated as descriptive statistics. Academic motivation was assessed in relation to personality traits, age, and academic year, with a significance level of $P \leq 0.05$. To evaluate predictors, multiple regression analysis was used.

Results: The participants had a mean age of 21.19±1.86 years. The highest mean score was observed for extrinsic motivation (5.16 ± 1.17), followed by intrinsic motivation (4.66 ± 1.18). Academic motivation showed a significant negative correlation with age and academic year and a positive correlation with the personality trait openness to experience. In multiple regression analysis, openness to experience and academic year emerged as significant predictors of academic motivation ($P \leq 0.05$), indicating that higher openness was associated with greater motivation, whereas advancing academic year was associated with lower motivation.

Conclusion: The most dominant dimension was extrinsic motivation. Academic motivation had a negative correlation with age and academic year and a positive correlation with the attribute "open to experience." The academic year and the openness to experience personality trait were found to be predictors of academic motivation.

Keywords: *Academic, Motivation, Personality, Students.*

Introduction

Students' approach to learning, the amount of effort they put in, and ultimately their academic performance, are all influenced by their level of academic motivation.[1] Academic underachievement and disengagement from the learning process are two outcomes of low motivation. Extrinsic influences, which originate from outside sources, and intrinsic factors, which originate from internal processes, can both inspire students. Extrinsic motivation (EM) is the expectation of a reward, outcome, or outside stimulation, while intrinsic motivation (IM) is the internal impulse that propels someone to perform a specific action.[2] It has been determined that intrinsic motivation has three sub-dimensions. The pleasure of learning new things is an

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intrinsic drive. Intrinsic motivation also includes the desire to accomplish something new. An urge to seek out sensory stimulation while participating in an activity is an example of intrinsic motivation.[3] Extrinsic motivations have been found to have three subdimensions: identified regulation (valuing a behavioral goal as personally important), introjected regulation (feelings of guilt or shame), and external regulation (behavior intended to meet an external demand).[4]

Students' academic motivation and achievement are significantly influenced by factors such as age, year of study, and personality. Personality characteristics are known to significantly influence academic motivation.[5] Nowadays, practically all personality assessments are based on the five-factor personality model. Conscientiousness, agreeableness, openness, neuroticism, and extraversion are some of these qualities.[6]

Apampa et al. found a strong positive correlation between conscientiousness and intrinsic motivation and a significant association between neuroticism and amotivation.[7] Researchers have found that the total scores of "Intrinsic Motivation-to Know", "Intrinsic Motivation-to Experience Stimulation", "Extrinsic Motivation-Introjected"," Extrinsic Motivation-Identified", and academic motivation total scores of freshmen students were found to be significantly higher than those of senior students.[8]

Since learning cannot occur without continuous drive, student motivation is an essential element of high-quality education. The primary human resources of the healthcare system are medical college students, who will be well positioned to contribute significantly to the delivery of medical and healthcare services in the years to come.[6] A high level of drive is necessary to thrive in the medical profession, and for medical students, motivation can be considered the key to productivity.[9] This implies that variables like age, academic year, and personality traits should be considered when assessing the motivation of medical students.

Few researches have examined the association between medical students' academic motivation and their personality traits. This study was an innovative attempt to fill this gap in the literature. The current study highlighted the most significant personality traits that affect the student's academic motivation. By doing this, the institution and teachers may foster an environment where students' varied personalities are welcomed and their enthusiasm for learning is heightened. In the present study, the primary research question was, "What roles do personality traits, age, and academic year play in predicting academic motivation among medical students?" Correspondingly, the objective was to determine how personality traits, age, and year of study predict academic motivation in medical students.

Methods

The study was conducted at the Department of Community Medicine, Lahore Medical and Dental College (LMDC), Lahore, Pakistan, from May 2024 to October of 2024. Lahore Medical and Dental College is a private-sector medical college.

All MBBS students of LMDC enrolled in 2024 were considered for inclusion in this cross-sectional study. Postgraduate trainees, interns, and those who declined to participate were excluded. A convenience sampling technique was used to recruit 616 participants.

A questionnaire consisting of three sections was used to collect data. The first section of the questionnaire contained background information of study participants, such as age and year of study. The Ten-Item Personality Inventory (TIPI) made up the second section of the survey. The five scales had good internal consistency coefficients (Cronbach's alpha), which ranged from 0.67 to 0.78. A seven-point Likert scale, with 1 denoting "strongly disagree" and 7 denoting "strongly agree," was used to rate each TIPI item. In order to calculate the dimension score (the mean score of two items), one of the sub-items for each of the Big Five factors (E-Extraversion, A-Agreeableness, C-Conscientiousness, ES-Emotional Stability, and O-Openness) was reverse-coded (for instance, a score of "7" is converted to a "1," and vice versa). Items two, four, six, eight, and ten have reverse scores. A higher level of the trait was indicated by a higher score.[10]

The third section of the questionnaire uses the 28-item Academic Motivation Scale (AMS) to measure students' motivation for academic activities and the reasons for that motivation. The scale includes seven subscales covering amotivation, intrinsic motivation,

and extrinsic motivation, with good internal consistency (Cronbach's alpha ranging from 0.71 to 0.92). Participants responded to each item on a seven-point Likert scale from 1 ("strongly disagree") to 7 ("strongly agree").[11]

Self-determination index (SDI) was calculated with the formula given below:

SDI = 2× (IM to know+ IM to accomplish+ IM stimulation)/3+iden - ((EM introjected+ EM external regulation)/2+2amotivation).

The SDI is an aggregate score from the Academic Motivation Scale, ranging from +18 to -18, reflecting the degree of self-determination, with higher scores indicating greater self-determination.

After entry of data, analysis was done using Statistical Package for Social Sciences (SPSS), version 22. Data was presented as tables and graphs. Descriptive statistics were used in terms of frequency, percentage and mean. To assess the correlation between personality traits, age and year of education of medical students with academic motivation, correlation coefficient (r) was calculated, with $P \leq 0.05$ as the limit for significance. Multiple regression analysis was conducted to assess the relationship between the predictors (personality traits and age) and the outcome variable (academic motivation, represented by SDI scores).

The Institutional Review Board of Lahore Medical and Dental College (LMDC) approved the study vide letter no. LMDC/L-ORIC-24-2024, dated 22nd April 2024. Informed written consent was obtained from the study participants.

Results

The study sample comprised 382 (57%) females and 234 (38%) males. Their mean age was 21.19±1.86 years (range = 17 – 27 years). The participants in the study included 146 (24%) first-year, 121 (20%) second-year, 101 (16%) third-year, 111 (18%) fourth-year, and 137 (22%) final-year medical students, for a response rate of 82% (616/755).

Table 1 depicts the medical students' mean and standard deviation of personality traits, academic motivation, and components of academic self-efficacy scores (SDI).

The mean scores for different personality types of medical students in descending order were extraverted (mean = 4.35±0.97), emotionally stable (mean = 4.34±0.93), open to experience (mean = 4.04±0.96), agreeable (mean = 4.26±0.99), and conscientious (mean = 3.92±0.89).

In the present study, academic motivation was high in 175 (28.40%), moderate in 177 (28.70%) and low in 265 (42.90%) of students. Among the study participants, extrinsic motivation stood out the highest with a mean score of 5.16±1.17. This was followed by intrinsic motivation with a mean score 4.66±1.18. The amotivation score was the lowest with a mean of 2.62±1.62.

Table 1: Mean and standard deviation of indices (N=616)	
Personality Traits	**Mean±SD**
Extraverted	4.35±0.97
Agreeable	4.26±0.99
Conscientious	3.92±0.89
Emotionally stable	4.34±0.93
Open to experience	4.04±0.96
Academic Motivation	
Intrinsic Motivation	4.66±1.18
To know	5.04±1.43
Towards accomplishment	4.86±1.35
For stimulation	4.08±1.40
Extrinsic Motivation	5.16±1.17
Identified	5.44±1.32
Introjected	4.85±1.54
External regulation	5.19±1.57
Amotivation	2.62±1.62
Self-Directed Index (SDI)	4.59±5.26

Table 2: Correlation between traits of personality, age and year of education and of medical students with academic motivation (N=616)

Variables	1	2	3	4	5	6	7	8
Age in years	1	-	-	-	-	-	-	-
Extraverted	−.092	1	-	-	-	-	-	-
Agreeable	.024	.165***	1	-	-	-	-	-
Conscientious	−.057	.134**	.207***	1	-	-	-	-
Emotionally Stable	−.027	.194***	.115**	.149***	1	-	-	-
Open to Experience	−.077	.123**	.123**	.175***	.154***	1	-	-
Year of study	−.888***	−.090	.001	−.046	−.048	−.071	1	
Motivation	−.150**	.036	−.011	.054	−.019	.104*	−.182***	1

*P≤0.05; **P<0.01; ***P<0.001*

Table 3: Regression analysis results for prediction of academic motivation through personality traits, age, and year of education (N=616)

Model	Unstandardized coefficients		Standardized coefficient		
	B (Regression Coefficient	Standard Error (SE)	Beta (β)	t-value	*P-value*
Constant	1.051	4.704	-	.224	.823
Extraverted	.099	.223	.018	.443	.658
Agreeable	−.162	.220	−.030	−.737	.462
Conscientious	.250	.245	.042	1.023	.307
Emotionally Stable	−.276	.231	−.049	−1.195	.233
Open to Experience	.518	.224	.094	2.311	.021
Age in years	.209	.224	.074	.856	.392
Year of study	−.848	.305	−.240	−2.779	.006

R = 0.216, R2= 0.047, F(s)= 4.248, P= 0.000

Academic motivation displayed a positive and significant correlation with the personality trait of open to experience and a statistically significant negative correlation with age and year of study. (Table 2).

In Table 3, a significant relationship between the predictor and outcome variables in our model (R= .216, R^2 = .047, F= 4.248, P <.001) is displayed. The predictor variables account for 4.7% of the variance in academic motivation among medical students. Concurring with the standardized regression coefficients and on examining their significance, the order of relative importance of the independent variables as predictors of motivation was found to be year of study (β= −.240, *P*= .006) followed by the personality trait of open to experience (β= .094, *P*= .021).

Discussion

This study sought evidence of three forms of motivation in medical students: amotivation, intrinsic motivation, and extrinsic motivation. Additionally, the effects of personality, academic year, and student age on academic motivation were investigated.

The findings of this study indicated that 28.4%, 28.7%, and 42.9% of students expressed high, moderate, and low levels of academic motivation, respectively. Another study from Alexandria University found that 75% of nursing students were moderately motivated to learn, 4% were highly

motivated, and 21% were lowly motivated.[12]

Extrinsic motivation was the most common form among respondents, with mean scores of 5.16±1.17. Then came intrinsic motivation, which had a mean score of 4.66±1.18. These findings align with a study by Gul S et al., which showed that extrinsic motivation levels were higher (5.15±1.19) and amotivation scores were lowest (2.71±1.60), compared with intrinsic motivation (4.75±1.24).[13] Cadête Filho AD et al.'s research showed an average intrinsic motivation score of 5.9 ± 0.7, which was higher than the extrinsic motivation score of 5.3 ± 1.2, in contrast to the results of the current study.[14] The discrepancy could be caused by different cultural values and different study settings.

As per the findings of the current study, the amotivation scores were the lowest, with a mean score of 2.62±1.62. Another study also showed the low amotivation score among Brazilian university students (1.97±1.03).[15] Research conducted in Italy by Zurlo MC et al. revealed an even lower amotivation score (1.45 ± 0.70).[16]

Intrinsic motivation comes from the desire to accomplish a goal. The results of the present study showed that the mean score for intrinsic motivation to increase knowledge was 5.04±1.43, but the mean scores for motivation to accomplish and motivation to experience stimulation were 4.86±1.35 and 4.08±1.40, respectively. The category "to know" had the highest mean (5.76±1.41) among the three sub-dimensions of intrinsic motivation, while "to experience stimulation" had the lowest mean (5.15±1.47), according to another study done among nursing students from three different nations.[17]

The study provides insights into the level of extrinsic motivation among medical students. Extrinsic motivation by identified regulation got the highest score (5.44±1.32), followed by external regulation (5.19±1.57) and introjection (4.85±1.54). In Serbia, a study found that identified regulation was highest (3.72±1.24), followed by external regulation (3.08±1.09), while introjection (2.47±1.09) had the lowest score.[18]

With a range of -15 to 17, the self-directed index (SDI) was 4.59±5.26. This result was consistent with a recent study by Nguyen MT et al., who reported that the SDI was 4.66 ± 4.18.[19] Another study found that the SDI for Congolese male students was -1.43±

0.05.20 and for female students it was -0.99±0.18.[20]

The study discovered that academic motivation and the personality trait of openness to experience were positively and significantly correlated. According to another study conducted among Turkish students, openness significantly and positively affects academic motivation (β=0.332, P<0.05).[21] The results of the Ahmadi et al. study demonstrated that academic motivation may be predicted by the personality qualities of conscientiousness, openness to experience, and extroversion.[22]

The present study found that medical students become less motivated to learn as they age. The motivation scores of the youngest undergraduates were higher. It was shown that there was a statistically significant negative correlation between age and academic motivation. According to a previous study, Cadête Filho AD et al. found a weak but significant negative correlation between age and the extrinsic motivation subscale for external control, with younger students often performing better.[14]

A statistically significant negative correlation between academic motivation and year of study was identified in a study examining the impact of the academic year on students' motivation. A Malaysian study found a moderate, non-significant association between academic motivation and the year of study.[23] Fourth-year students' academic motivation mean scores were substantially higher than first-year students' mean scores. Koyuncuoglu Ö et al. and Naipal et al. found that, unlike our findings, first-year undergraduate optometry students had the lowest mean scores among the study participants.[24,25] One possible explanation for this disparity is the different study settings. There are some limitations of this research.

The results of this single-centre study cannot be applied to all medical students in Pakistan. Furthermore, a causal association could not be demonstrated due to the cross-sectional study design. Although our study achieved a large sample, the use of convenience sampling may introduce sampling bias. Future research should consider multi-center study settings and probability-based sampling methods to enhance representativeness and reduce sampling bias, thereby improving the external validity of findings. Additionally, student

support services such as mentoring, peer support programs, and academic advising that focus on students' strengths, goals, and purpose can sustain motivation throughout the academic journey and help buffer declines in engagement over time.

Conclusion

The most dominant subtype of academic motivation was extrinsic motivation, whereas the lowest scores were obtained from amotivation. The sub-dimension identified regulation had the highest mean score. The study found a negative correlation between students' age and academic year, and a significant positive correlation between academic motivation and the personality trait of openness to experience. Academic motivation was predicted by the academic year and the openness to experience personality traits.

The curriculum designers should integrate real-world relevance, project-based tasks, and opportunities for autonomy to make learning more meaningful and engaging.

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Author Contributions
SD: Conception and design of the work, revising, editing, and supervising for intellectual content
SM: Manuscript writing for methodology design and investigation, writing the original draft, proofreading, and approval for final submission
SNI: Validation of data, interpretation, and write-up of results
AI: Data acquisition, curation, and statistical analysis

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