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ORIGINAL RESEARCH

Predictors of College Academic Achievement for Medical Students: The Case of Gondar University, College of Medicine and Health Sciences, Ethiopia

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Background: In Ethiopia, the University Entrance Exam (UEE) score is the only criteria for selecting prospective medical students entering the university system, disregarding their career choice motivation.

Methods: A cross-sectional study design was conducted to identify medical students career choice motivation and predictors of college academic achievement at Gondar university, Ethiopia. The study was conducted on 222 medical students enrolled at Gondar University in 2016. A self-administered questionnaire was used to collect data on study participants demographic characteristics, career choice motivation, and informed career choice. Data on the UEE score and student's college academic achievement were collected from the university registrar. Descriptive statistics and regression analysis were used to analyze the data.

Results: Desire to help others as a medical doctor and prevent and cure diseases were mentioned as the first important career choice reasons by 147 (68.2%) and 135 (64.0%) study participants, respectively. The results of regression analysis showed that the UEE score was significantly associated with pre-clinical cumulative GPA (R^2=.327, p<.05) and 5th year cumulative GPA (R^2=.244, p<.05) respectively. The stepwise multiple regression revealed that UEE score, having prior knowledge about medical profession, positive experience in the medical school, and intrinsic career choice motivation significantly predicted 5th year cumulative GPA (p<.05). The high beta weight of 0.254 and 0.202 confirmed the strongest prediction to come from prior knowledge about the medical profession and positive experience in medical school, respectively.

Conclusion and Recommendation: The UEE score is a significant predictor for medical students' academic achievement, but it should not be the sole admission criterion. We suggest that comprehensive admissions criteria covering both cognitive and non-cognitive factors, as well as informed career choice, be developed to select the best applicants in the future.

Keywords: university entrance examination score, career choice motivation, informed career choice, students' academic achievement

Background

In most health professional programs, determining admission criteria that will predict effective student outcomes is a difficult task. The abilities of individuals admitted and kept as students are widely acknowledged to have a considerable impact on the quality of higher education. Student selection and admission policies and practices, according to many researchers, should be designed to ensure a good match between the applicant's abilities and aptitudes and the demands of the program.[1–4] However, there is little known about how Ethiopian Higher Education admission and placement policies and procedures ensure quality education in the face of rapid higher education expansion and high student enrollment.

In Ethiopia, college readiness has been defined almost entirely in academic terms, with selection based on extremely narrow criteria. The sole criterion for selecting and admitting students to various higher education institutions is academic achievement in the University Entrance Examination (UEE). Medical students' admission and placement

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into Ethiopian universities depends on meeting the cut-off mark set by the Ministry of Education. It is believed that the UEE score will positively predict medical students' academic performance in the university. However, there are numerous examples of students who perform admirably at UEE but fail to do so at university. Furthermore, grade inflation and increased awareness of the importance of non-cognitive factors have influenced perceptions of the validity of current medical students' selection processes around the world.[5–7]

Several studies have been conducted all over the world to determine which factors are better predictors of future academic success in university education. Research findings show that high school grade point average, UEE score, or standardized test score are assumed to be the best predictors of students' academic performance in higher education.[8–10] Several research reports in the literature, on the other hand, indicate that prior academic achievement is not the only determining factor of success in medical education and professional practice.[11–13] Studies have shown that, prior academic achievement accounts for only a portion of the variance in medical school performance and does not provide enough variance to allow meaningful differentiation on which to base selection decisions.[14–16] These findings suggest that other factors, such as personal qualities should also be considered when selecting candidates for medical school.

Medical students' motivations for pursuing a medical career have been found to have an impact on medical students' academic achievement and future career success. Literature indicates that medical students career choice motivation may be influenced by intrinsic and extrinsic factors.[17–19] According to the Self Determination Theory (STD), high intrinsic motivation leads to better learning, better outcome, better academic performance, creativity, persistence, and higher levels of well-being than individuals with external motivation.[18,20,21]

Many scholars stress the importance of informed career choice for students' academic and professional success. However, in practice, students choose medical careers based solely on academic achievement and future job availability, with no clear understanding of medical education and profession. According to the research findings, many medical students end up in jobs they do not like and may not be able to use their skills to their full potential.[22–25] As a result, it is important to understand what drives medical students to pursue a career in medicine. Furthermore, despite the fact that several studies have looked into the relationship between college academic achievement and career choice motivation across the globe, little is known about how the Ethiopian UEE score and career choice motivation influence medical students' college academic achievement. Therefore, this study identified medical students career choice motivation and investigated factors that predict medical students' college academic achievement at Gondar University, College of Medicine and Health Sciences.

Method

Study Design and Sample

This study was carried out at Gondar University, College of Medicine and Health Sciences. A cross-sectional, quantitative, correlational study design was employed to identify the reasons that motivated students to choose a medical career and investigate predictors of their college academic achievement. The study was conducted on 222 undergraduate medical students enrolled at Gondar University Medical school in the academic year of 2016. Dismissed, dropout and withdrawn students were excluded from the study due to the difficulty of tracing data from them.

Predictor Variables

University Entrance Exam Score

In Ethiopia, students join medical school after 12 years of education which ends in the university entrance examination. The UEE is a centralized, nationwide examination, and scores are reported on the same scale for all students. UEE is designed to measure a student's readiness for future University academic success. This exam is composed of a combination of different courses. These courses are English, Physics, Chemistry, Biology, Scholastic aptitude, Civics and Ethical Education and Mathematics. Each course consists of a range of 45–100 multiple-choice items of four alternatives. Each subject's score is weighted from 100%. The scores used to make significant decisions about students' admission to university. The maximum percentage score on the entrance test is 700%. The cutoff point varies from year

to year. Every year, UEE cutoff scores for undergraduate university entrance are determined at higher official level by considering the Ministry of Education enrollment plan for the year, students' UEE score and university intake capacity.

Career Choice Motivation

Designed to explore students' reasons for studying medicine. The career choice consists of the intrinsic and extrinsic components of motivation for applying to medical school and has four items on intrinsic motivation and eight items on extrinsic motivation. Each item was rated on a 5-point Likert scale (ranged from the first important reason to not important to me at all). The questionnaire was adapted from the instrument, "Career Choice Motivation" by Pagnin et al (2016) and modified to the Ethiopian context.

Informed Career Choice

Designed to investigate the associations between students' prior knowledge of the medical profession, age at which they decided to become a medical doctor as well as their feelings about their medical school experience with student's college academic achievement. It was written in the form of yes/no questions and contains a total of five items.

The questionnaires were pre-tested among 8 medical students from the same cohort at another medical college to ensure content validity. The items modified based on their feedback. Cronbach's alpha was .85 for career choice motivation and .78 for informed career choice.

Outcome Variables

Medical School Grade Point Average (GPA)

This outcome variable includes students pre-clinical (years 1, 2, 3) cumulative GPA and 5th year (years 1, 2, 3, 4, 5) cumulative GPA.

Data Collection Method

Data related to participants' demographics, informed career choice, and career choice motivation were collected using predesigned self-report questionnaire. The UEE score and college academic achievement (GPA) of all study participants were collected from the registrar's student record database. Ethical approval was obtained from Jimma University, Institute of Health institutional review board and verbal and written consent was obtained from all participants.

Analysis

Data were analyzed using descriptive statistics and regression analysis. Associations were considered significant with *p*-values smaller .05. All analyses were performed using SPSS statistical software (SPSS 26). Multicollinearity were checked for each variable prior to regression analysis. In order to examine the predictive power of different combinations of predictor variables, stepwise multiple regression was performed for each outcome variable. All variables in each predictor set were entered simultaneously into a stepwise regression procedure where the significance of each variable which was introduced into the model was assessed until the best fitting model was obtained.

Result

A total of 222 students completed the questionnaires. Eleven collected questionnaires were omitted since they were considered as invalid (no response, incomplete response, or the same response to each item). Finally, 211 questionnaires were considered valid (58 females and 153 males). The response rate was approximately 95.1%. Participant ages ranged from 22 to 27 years (M=24.23, SD =0.959). Majority of the study subjects 117 (55.5%) male and 34 (16.1%) female attended their high school at a government school.

Concerning informed career choice, 91 (43.1%) of male and 29 (13.7%) of female survey participants had prior knowledge of the medical profession before deciding to attend medical school. The University of Gondar was not the first choice for 128 (60.7%) of the study participants. Regarding their medical school experience, 111 (52.6%) said, "My experience in medical school so far makes me feel I have made the right career decisions. Almost all the study subjects 190 (90.0%) said, I wish I have had career advice/guidance about medical career and other options before joining medical school (Table 1).

Table 1 Informed Career Choice of the Study Subjects at Gondar University, Medicine and Health Science Colleges, School of Medicine, 2021, Ethiopia

Variables	Frequency		Total
	Male	Female	
At what age did you decide to become a medical doctor			
• **6–9 years of age**	15(7.1%)	4(1.9%)	19(9.0%)
• **10–15 years of age**	18 (8.5%)	10(4.7%)	28 (13.3%)
• **16–18 years of age**	120 (56.9%)	44 (20.9%)	164(77.7%)
Total	153 (72.5%)	58(27.5)	211(100%)
Was University of Gondar your first choice			
• **Yes**	66(31.3%)	17 (8.1%)	83(39.3%)
• **No**	87 (41.2%)	41 (19.4%)	128(60.7%)
Total	153 9(72.5%)	58(27.5%)	211(100%)
Before deciding to join medical school, I had knowledge about the medical profession			
• **Yes**	91(43.1%)	29(13.7%)	120(56.9%)
• **No**	62(29.4%)	29(13.7%)	91(43.1%)
Total	153 (72.5%)	58(27.5%)	211(100%)
My experience in the medical school so far makes me feel I have made the right decisions about my career			
• **Yes**	86(40.8%)	25(11.8%)	111(52.6%)
• **No**	67(31.8%)	33(15.6%)	100(47.4%)
Total	153 (72.5%)	58(27.5%)	211 (100%)
I wish I had had career advice/guidance about medical career and other options			
• **Yes**	135(64.0%)	55 (26.1%)	190(90.0%)
• **No**	18 (8.5%)	3(1.4%)	21(10.0%)
Total	153 (72.5%)	58(27.5%)	211(100%)

Looking at reasons that motivated the choice of medicine as a career as indicated in Table 2, the two most highly rated intrinsic reasons were the desire to help others as a medical doctor and the desire to prevent and cure disease. The desire to help others as a medical doctor and the desire to prevent and cure diseases were mentioned as the first important career choice reasons by 147 (68.2%) and 135 (64.0%) study participants respectively. On the other hand, the two extrinsic factors rated the highest were having good grades in high school 127 (60.2%) and the certainty of finding a job 120 (56.9%).

To investigate the predictive value of the UEE score for students' academic achievement, each outcome variable (pre-clinical cumulative GPA and 5th year cumulative GPA) was regressed separately. As indicated in Table 3 the UEE score significantly and positively predicted pre-clinical cumulative GPA (B=0.009, R^2=.327, t=10.08, p<.05, CI: 0.007, 0.011). UEE score accounts for 32.7% (R^2=.327) of the variation in students' pre-clinical cumulative GPA performance. The remaining (67.3%) of the variation was explained by the other factors.

Similarly, as indicated in Table 4, the UEE score was significantly and positively associated with medical student's total 5th year cumulative GPA (B=0.006, R^2=.244, t=8.215, p<.05, CI: 0.005, 0.008) while other variables held constant. Similarly, the value of R^2=.244 shows that in this model, the UEE score accounts for 24.4% of the variation in students'5th year cumulative GPA performance. This explained variation is significant but smaller, leaving a large amount of variance still unexplained.

Table 2 Career Choice Motivation of the Study Subjects at Gondar University, Medicine and Health Science Colleges, School of Medicine, 2021, Ethiopia

Variables	1st Important Reason		2nd Important Reason		3rd Important Reason		4th Important Reason		Not Important to Me	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
An interest in medical sciences	96(45.5%)	30(14.2%)	32(15.2%)	20(9.5%)	12(5.7%)	3(1.4%)	10(4.7%)	5(2.4%)	3(1.4%)	0
A desire to help others as a medical doctor	110(52.1%)	37(16.1%)	21(10.0%)	13(6.2%)	13(6.2%)	7(3.3%)	8(3.8%)	0(0%)	1(0.5%)	4(1.9%)
Desire to prevent/cure disease	101(47.9%)	34(16.1%)	27(12.8%)	8(3.8%)	14(6.6%)	10(4.7%)	8(3.8%)	3(1.4%)	3(1.4%)	3(1.4%)
Interest in human relationships	67(31.8%)	16(7.6%)	27(12.8%)	15(7.1%)	16(7.6%)	13(6.2%)	18(8.5%)	8(3.8%)	25(11.8%)	6(2.8%)
Good grades at high school	99(46.9%)	28(13.3%)	24(11.4%)	13(6.2%)	12(5.7%)	7(3.3%)	9(4.3%)	6(2.8%)	9(4.3%)	4(1.9%)
Previous experience of personal and family illness	45(21.3%)	14(6.6%)	45(21.3%)	15(7.1%)	16(7.6%)	8(3.8%)	21(10.1%)	5(2.4%)	26(12.3%)	16(7.6%)
A desire to obtain a profession with high social prestige	39(18.5%)	9(4.3%)	56(26.5%)	20(9.5%)	11(5.2%)	7(3.3%)	16(7.6%)	10(4.7%)	31(14.7%)	12(5.7%)
The certainty of finding job	90(42.7%)	30(14.2%)	28(13.3%)	11(5.2%)	6(2.8%)	5(2.4%)	15(7.1%)	7(3.3%)	14(6.6%)	5(2.4%)
The possibility of achieving high earnings	63(29.9%)	24(11.4%)	35(16.6%)	12(5.7%)	23(10.9%)	8(3.8%)	10(4.7%)	7(3.3%)	22(10.4%)	7(3.3%)
The desire to fulfill my parents' expectation	49(23.2%)	18(8.5%)	41(19.4%)	15(7.1%)	31(14.7%)	9(4.3%)	19(9.0%)	9(4.3%)	13(6.2%)	7(3.3%)
Most of my friends are applying to study medicine	18(8.5%)	4(1.9%)	29(13.7%)	13(6.2%)	39(18.5%)	9(4.3%)	20(9.5%)	9(4.3%)	47(22.3%)	23(10.9%)
The desire to continue the family tradition	8(3.8%)	2(0.9%)	21(10.0%)	5(2.4%)	27(12.8%)	8(3.8%)	27(12.8%)	14(6.6%)	70(33.2%)	29(13.7%)

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Table 3 Regression Analysis Between University Entrance Exam Score and Preclinical Cumulative GPA at Gondar University, Medicine and Health Science Colleges, School of Medicine, 2021, Ethiopia

Independent Variable	Unstandardized Coeff						95% CI	
	B	Std. Error	*R*	R^2	*t*	*p*-value	Upper B	Lower B
(Constant	−1.520	0.469			−3.242	0.001	−2.44	−595
University entrance examination score	0.009	0.001	0.572	0.327	10.08	0.000	0.007	0.011

Table 4 Regression Analysis Between University Entrance Exam Score and 5th Year Cumulative GPA at Gondar University, Medicine and Health Science Colleges, School of Medicine, 2021, Ethiopia

Independent Variable	Unstandardized Coefn						95.0% CI	
	B	Std. Error	*R*	R^2	*t*	*p*-value	Upper B	Lower B
(Constant)	−0.327	0.405			−0.808	0.420	−1.127	0.472
University entrance examination score	0.006	0.001	0.496	0.244	8.215	0.000	0.005	0.008

A bivariate regression analysis was performed to determine whether socio-demographic, career choice motivation, and informed career choice variables predict medical students' university academic achievement. Finally, all the predictor variables with a *p*-value <.25 in the bivariate regression were entered into a stepwise multiple regression to investigate their multiple effect on the pre-clinical and 5th years cumulative GPA. As shown in Table 5, when all the predictor variables with a *p*-value <.25 were entered into the stepwise regression equation, the result revealed that the UEE score,

Table 5 Results of Stepwise Multiple Regression Analysis Between Independent Variables and Pre-Clinical Cumulative GPA at Gondar University, Medicine and Health Science Colleges, School of Medicine, 2021, Ethiopia

Independent Variables	Unstandardized Coefficients		95.0% CI				Collinearity Statistics	
	B	Std. Error	Lower B	Upper B	*t*	*p*-value	Tolerance	VIF
(Constant)	−0.162	0.418	−0.985	0.661	−0.388	0.698		
UEE score	0.006	0.001	0.004	0.008	7.037	0.000	0.812	1.232
Gender								
• Female	-	-	-	-	-	-		
• Male	0.098	0.041	0.016	0.180	2.368	0.019	0.942	1.061
Gondar University is my first choice								
• No	-	-	-	-	-	-		
• Yes	0.084	0.037	0.010	0.157	2.243	0.026	0.968	1.033
Have knowledge about medical profession before joining medical school								
• No	-	-	-	-	-	-	-	-
• Yes	0.210	0.042	0.127	0.293	5.011	0.000	0.748	1.337
My experience in the medical school makes me feel I have made the right decisions about my career								
• No	-	-	-	-	-	-	-	-
• Yes	0.217	0.040	0.139	0.296	5.460	0.000	0.817	1.225

Table 6 Results of Stepwise Multiple Regression Analysis Between Independent Variables and 5th Year Cumulative GPA at Gondar University, Medicine and Health Science Colleges, School of Medicine, 2021, Ethiopia

Independent Variables	Unstandardized Coefficients		95.0% CI				Collinearity Statistics	
	B	Std. Er	Lower B	Upper B	t	*p*-value	Tolerance	VIF
(Constant)	−0.162	0.418	−0.985	0.661	−0.388	0.698		
UEE score	0.003	0.001	0.002	0.005	4.876	0.000	0.833	1.201
Have knowledge about medical profession before joining medical school								
• No	-	-	-	-	-	-	-	-
• Yes	0.254	0.034	0.187	0.320	7.533	0.000	0.756	1.323
My experience in the medical school makes me feel I have made the right decisions about my career								
• No	-	-	-	-		-		
• Yes	0.202	0.032	0.138	0.265	6.294	0.000	0.822	1.217
Intrinsic career choice motivation	0.038	0.017	0.004	0.072	2.202	0.029	0.991	1.009

having prior knowledge about medical profession, and positive experience in the medical school significantly predicted pre-clinical cumulative GPA (B=0.006, t=7.037, p=.000), (B=0.210, t=5.011 and p=.000), and (B=0.217, t=5.460, p=.000) respectively. The high beta weight of 0.210 and 0.217 confirms the strongest prediction to come from prior knowledge about medical profession and positive experience in the medical school respectively.

Similarly, as indicated in Table 6, the UEE score, having prior knowledge about medical profession, and positive experience in the medical school significantly predicted 5th year cumulative GPA (B=0.003, t=4.876, p=.000), (B=0.254, t=7.533, p=.000), and (B=0.202, t=6.294, p=.000) respectively.

Including other predictor variables to the UEE score nearly doubled the variance explained (R^2=54.9%) and (R^2=55.6%) in the preclinical and 5th year cumulative GPA, respectively. In this model, intrinsic career choice motivation was found to be predictive of students' 5th year cumulative GPA (B=0.038, t=2.202, p<.05).

Discussion

Career choice motivation is one of several constructs of motivation that are frequently considered when selecting medical students. Many factors influence students' decision to pursue a career in medicine. In this study, majority of study participants ranked intrinsic motivation as the most important reason. The desire to help others 147 (68.2%), the desire to prevent/cure disease 135 (64.0%), and an interest in medical science 126 (59.7%) were ranked first important reason by both male and female students. These findings are consistent with other studies which point out the importance of intrinsic motivation for career choice.[26–29]

Out of a total respondent, 127 (60.2%) individuals prioritized good high school grades as the most important reason for them to pursue a career in medicine from list of extrinsic motivation. Similarly, the certainty of finding a job and the possibility of earning a high salary were ranked as the most important reasons by 120 (56.9%) and 87 (41.3%) respondents, respectively. This implies that intrinsic motivation, despite its importance, is not the only consideration for students plans for a career in medicine.[25,30,31]

According to the findings of the current study, stepwise multiple regression showed that, students' intrinsic career choice motivations were positively and significantly related to students overall 5th year cumulative GPA (B= 0.041, p<.05, CI: 0.003, 0.079), but not to their pre-clinical cumulative GPA. This study contradicts to other study which revealed that intrinsic motivation has been found to correlate with higher academic achievement in both pre-clinical and clinical years.[19,32,33] The reason that intrinsic motivation was not found to be predictive of students' pre-clinical

cumulative GPA could be due to a variety of factors, including the environment, teaching learning strategy, study habits, and the curriculum, can all influence students' intrinsic motivation, especially in their early years of college education.

On the other hand, there were other studies that failed to find significant correlations between students' career choice motivation and their college academic achievement.[34,35] Similarly, in this study, extrinsic career choice motivation was not found to be predictive of students' academic achievement in either the pre-clinical or 5th year cumulative GPA.

Regarding to the relationship between the UEE score and academic achievement, the result of regression analysis showed that the UEE score was significantly and positively associated with pre-clinical and 5th year cumulative GPA, in line with others studies.[8,36–38] Generally, the present study shows that the UEE score is a significant and positive predictor of medical students' university academic achievement, however, the amount of academic performance explained is quite low, with 32.7% and 24.4% in the pre-clinical and 5th year cumulative GPA, respectively. These variations are less than 40% leaving a large amount of variance still unexplained. This finding is consistent with other studies.[15], [39–41] All of these findings suggest that the UEE score is a significant predictor of medical students' academic achievement, but it should not be the sole admission criterion. Instead, it should be used in conjunction with other criteria.

Informed career choice is the first and most important step in the student selection and admission process to health sciences colleges. Regarding prior knowledge, only 91 (43.1%) of male and 29 (13.7%) of female survey participants had prior knowledge of the medical profession before deciding to attend medical school and those who have knowledge before joining medical education have the highest mean score for both pre-clinical and 5th years cumulative GPA. This finding contradicts a study conducted in India, which found that less than 20% of students had knowledge about the medical profession before deciding to attend medical school.[42] Similarly, a study of 248 first and second year Australian medical students found that only 18 (11%) claimed to have good or adequate knowledge about medical profession before deciding to attend medical school, while the remaining 144 claimed to have none.[43] The current study's high number of students with prior knowledge of the medical profession could be attributed to today's advanced information technology.

Regarding their medical school experience, in the present study 100 (47.4%) said, my experience in medical school so far makes me feel I have not made the right career decisions. This finding is in line with a previous study conducted among medical students in Australia, Brazil, Iran.[43–45] The results of regression analysis indicated that having prior knowledge and positive experience in the medical school are statistically significant (p <0.05) predictor of both preclinical and 5th years cumulative GPA. This finding is consistent to one found in an Iranian study of medical students, which found that students who had made an informed choice of medicine had greater final year scores and satisfaction than those who had not.[44]

According to research findings, satisfaction with a career in medicine would almost certainly result in a longer career and higher quality of care. Doing this can minimize dropout, disappointment, and negative attitudes towards medical education and career.[22,45] Thus, this finding adds a new perspective into the need to develop informed career choice guidance in the selection process of medical students in Ethiopia. Students should not be left alone in their decision to pursue a career, as this will have a significant impact on their future paths as professionals. They should be given plenty of advice and information to help them make better, more informed decisions.

Strength and Limitation of the Research

This is the first study in Ethiopia to evaluate the factors that influence students' decision to choose a medical career and the predictors of medical students' college academic success. Limitation of this study include

- First and foremost, this was a preliminary study, with a relatively small sample from a single institution.
- Variables like socio-economic, educational status, informed career choice have not been explored in enough detail.
- The self-administered questionnaire might also generate response bias, if participants tend to give more socially desirable responses.
- This study was conducted as a cross-sectional study, so the cause-effect relationships were limited.

- Dismissed, dropout, and withdrawn students were excluded from the study due to the difficulty of tracing data from them.

Conclusion and Implication

The findings of the present study indicate that UEE score is a significant and positive predictor of students' university academic achievement. UEE scores are a better predictor for academic achievement in the early phase of medical school than for GPA in the later phase of medical school. However, the amount of academic achievement explained by the UEE score leaves a large amount of variance still unexplained. This suggests that, while the UEE score is a substantial predictor of students' university academic achievement, it should not be used alone as a criterion for admission; rather, it should be used in conjunction with other criteria. The study also found that prior knowledge and positive experiences in medical school are significant predictors of both preclinical and 5th-year cumulative GPA. It is therefore critical that applicants for medical studies receive accurate information about the medical profession in order to make an informed study decision. As a result, the researcher suggests that medical schools and policymakers in charge of medical student selection and admission pay more attention to informed career choices, because informed career choices can have a significant impact on medical students' academic success and satisfaction. This study may serve as a baseline for further research to better understand the association between the UEE score, career choice motivation, and informed career choice with academic achievement in the field of health science education.

Ethics Approval and Consent to Participate

The study was conducted in accordance with World Medical Association Declaration of Helsinki Ethical Principles for Medical Research involving human subjects, article number 23 – 26 which is amended in October 2013. Before collecting data, verbal and written informed consent were obtained from each study participant. The purpose of the study was explained to all consenting participants. The approval from IRB included the use of verbal and written consent.

Consent for Publication

The consent included permission to publish the anonymized response.

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Disclosure

The authors declared that there is no competing of interests in this work.

References

1. Ezeala CC, Ezeala MO, Shaikh V, et al. Medical school admissions: a review of global practices, predictive validity, and practice points for Africa. *Med J Zambia*. 2020;47(3):227–236.
2. Wilcox RE, Lawson KA. Predicting performance in health professions education programs from admissions information–comparisons of other health professions with pharmacy. *Curr Pharmacy Teach Learn*. 2018;10(4):529–541. doi:10.1016/j.cptl.2017.12.004
3. Schwartzstein RM. Leveraging the medical school admissions process to foster a smart, humanistic, and diverse physician workforce. *Acad Med*. 2020;95(3):333–335. doi:10.1097/ACM.0000000000003091
4. Ellaway RH, Malhi R, Bajaj S, Walker I, Myhre D. A critical scoping review of the connections between social mission and medical school admissions: BEME Guide No. 47. *Med Teach*. 2018;40(3):219–226. doi:10.1080/0142159X.2017.1406662
5. Fonteyne L, Duyck W, De Fruyt F. Program-specific prediction of academic achievement on the basis of cognitive and non-cognitive factors. *Learn Individ Differ*. 2017;56:34–48. doi:10.1016/j.lindif.2017.05.003

6. Agarwal A, Arya B. Role of non-cognitive skills in academic performance. *PalArch's J Archaeol Egypt*. 2021;18(4):5825–5837.
7. Sobowale K, Ham SA, Curlin FA, Yoon JD. Personality traits are associated with academic achievement in medical school: a nationally representative study. *AcademicPsychiatry*. 2018;42:338–345.
8. Hendi A, Mahfouz MS, Alqassim AY. Admission grades as predictors of medical students' academic performance: a cross-sectional study from Saudi Arabia. *Eur J Investig Health Psychol Educ*. 2022;12(11):1572–1580. doi:10.3390/ejihpe12110110
9. Galla BM, Shulman EP, Plummer BD. Why high school grades are better predictors of on-time college graduation than are admissions test scores: the roles of self-regulation and cognitive ability. *Am Educ Res J*. 2019;56(6):2077–2115. doi:10.3102/0002831219843292
10. Sulphey MM, AlKahtani NS, Syed AM. Relationship between admission grades and academic achievement. *Entrepreneursh Sustain Issues*. 2018;5 (3):648–658. doi:10.9770/jesi.2018.5.3(17)
11. Dabaliz -A-A, Kaadan S, Dabbagh MM. Predictive validity of pre-admission assessments on medical student performance. *Int J Med Educ*. 2017;8:408. doi:10.5116/ijme.5a10.04e1
12. Makransky G, Havmose P, Vang ML, Andersen TE, Nielsen T. The predictive validity of using admissions testing and multiple mini-interviews in undergraduate university admissions. *High Educ Res Dev*. 2017;36(5):1003–1016.
13. Irasanti SN, Akbar IB, Dewi MK, Susanti Y. The capability of selection tools to predict future academic performance of medical students. *J Phys Conf Ser*. 2020;1469(1):012138.
14. Yousefi Afrashteh M. Predictors of students' academic achievements in allied health professions at King Saud University: a retrospective cohort study. *BMC Med Educ*. 2021;21(1):1–7. doi:10.1186/s12909-020-02436-3
15. Davies BS, Rafique J, Vincent TR. The validity of Iran's national university entrance examination (Konkoor) for predicting medical students' academic performance. *BMC Med Educ*. 2012;12:1–8. doi:10.1186/1472-6920-12-1
16. Alla ND. The predictive validity of prior academic achievement as an indicator of medical students' performance at University of Khartoum. *J Med Educ*. 2019;18(3):245.
17. Torres-Roman JS, Cruz-Avila Y, Suarez-Osorio K. Motivation towards medical career choice and academic performance in Latin American medical students: a cross-sectional study. *PLoS One*. 2018;13(10):e0205674. doi:10.1371/journal.pone.0205674
18. Wu H, Li S, Zheng J, Guo J. Medical students' motivation and academic performance: the mediating roles of self-efficacy and learning engagement. *Med Educ Online*. 2020;25(1):1742964. doi:10.1080/10872981.2020.1742964
19. Hayat AA, Salehi A, Kojuri J. Medical student's academic performance: the role of academic emotions and motivation. *J Adv Med Educ Professional*. 2018;6(4):168.
20. Ryan RM, Deci EL. Intrinsic and extrinsic motivation from a self-determination theory perspective: definitions, theory, practices, and future directions. *Contemp Educ Psychol*. 2020;61:101860. doi:10.1016/j.cedpsych.2020.101860
21. Rayner G, Papakonstantinou T. The use of self-determination theory to investigate career aspiration, choice of major and academic achievement of tertiary science students. *Int J Sci Educ*. 2020;42(10):1635–1652. doi:10.1080/09500693.2020.1774092
22. ten Cate OTJ, 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):961–973. doi:10.3109/0142159X.2011.595435
23. Gennissen L, Stegers-Jager K, van Exel J. Career orientations of medical students: a Q-methodology study. *PLoS One*. 2021;16(5):e0249092. doi:10.1371/journal.pone.0249092
24. Rani NA, Nusrath A, Dhanalakshmi TA. Medical profession as career–pressure or passion: a cross sectional survey among undergraduate medical student. *J Med Sci Educ*. 2016;3(4):322–327.
25. Jothula KY, Ganapa P, Naidu NK. Study to find out reasons for opting medical profession and regret after joining MBBS course among first year students of a medical college in Telangana. *Int J Commun Med Public Health*. 2018;5(4):1392–1396. doi:10.18203/2394-6040.ijcmph20180983
26. Cui X, Ding N, Jiang N, Li H, Wen D. Preliminary study of the relationship between career choice motivation and understanding of professionalism in newly enrolled medical students in China: a cross-sectional study. *BMJ open*. 2021;11(2):e041860. doi:10.1136/bmjopen-2020-041860
27. Hassan M, Shahzad F, Waqar SH. Seeking motivation for selecting medical profession as a career choice. *Pak J Med Sci*. 2020;36(5):941. doi:10.12669/pjms.36.5.2799
28. Narayanasamy M, Ruban A, Sankaran PS. Factors influencing to study medicine: a survey of first-year medical students from India. *Korean J Med Educ*. 2019;31(1):61. doi:10.3946/kjme.2019.119
29. Dwyer T, Wright S, Kulasegaram KM. Career motivation and burnout among medical students in Hungary-could altruism be a protection factor? *BMC Med Educ*. 2016;16:1–8. doi:10.1186/s12909-015-0506-z
30. Syakurah RA, Rosyila R. Medical student career choice's determinants in Asia: a systematic review. *Int J Public Health Sci*. 2020;9(1):57–61.
31. Zayabalaradjane Z, Ponnusamy M, Nanda N, Dharanipragada K, Kumar S. Factors influencing medical students in choosing medicine as a career. *Online J Health Allied Sci*. 2019;17(4):1–3.
32. Bailey TH, Phillips LJ. The influence of motivation and adaptation on students' subjective well-being, meaning in life and academic performance. *High Educ Res Dev*. 2016;35(2):201–216. doi:10.1080/07294360.2015.1087474
33. Muntean LM, Nireștean A, Sima-Comaniciu A, Măruşteri M, Zăgan CA, Lukacs E. The relationship between personality, motivation and academic performance at medical students from Romania. *Int J Environ Res Public Health*. 2022;19(15):8993. doi:10.3390/ijerph19158993
34. Shahid Z, Fatima K, Siddiqui F, Panhwar G. Association of career choice and motivation with academic performance. *J Xi'an Shiyou Univ*. 2022;18 (9):125.
35. Nazir R, Kaleem M, Aamer S, Zaib N, Malik A, Anwar FS. Can we predict students' academic achievement through motivation and preadmission scores? A cross-sectional study. *Pak Orthodont J*. 2022;14(1):43–50.
36. Al-Qahtani MF, Alanzi TM. Comparisons of the predictive values of admission criteria for academic achievement among undergraduate students of health and non-health science professions: a longitudinal cohort study. *Psychol Res Behav Manag*. 2018;2018:1–6.
37. Almutairi S. Association between pre-admission scores and student's performance among students of Saudi. *J Qual Healthcare Eco*. 2022;5 (6):000316.
38. Migliaretti G, Bozzaro S, Siliquini R, Stura I, Costa G, Cavallo F. Is the admission test for a course in medicine a good predictor of academic performance? A case− control experience at the school of medicine of Turin. *BMJ open*. 2017;7(11):e017417. doi:10.1136/bmjopen-2017-017417
39. Yousefi Afrashteh M. Relationship between admission criteria and academic performance in basic science courses in health science colleges in KAU. *BMC Med Educ*. 2021;21:1–8.

40. Krys K, Capaldi CA, van Tilburg W. The predictive validity of university admission examinations: case study of Nigerian unified tertiary matriculation examination. *Covenant Int J Psychol*. 2018;21–26. doi:10.1002/ijop.12420
41. Almarabheh A, Shehata MH, Ismaeel A, Atwa H, Jaradat A. Predictive validity of admission criteria in predicting academic performance of medical students: a retrospective cohort study. *Front Med*. 2022;2666.
42. Shankar N, Singh S, Gautam S, Dhaliwal U. Medical education motivation and preparedness of first semester medical students for a career in medicine. *Indian J Physiol Pharmacol*. 2013;57(4):432–438.
43. Marley J, Carman I. Selecting medical students: a case report of the need for change. *Med Edu*. 1999;20:247.
44. Farrokhi-Khajeh-Pasha Y, Nedjat S, Mohammadi A, Malakan Rad E, Majdzadeh R. Informed choice of entering medical school and academic success in Iranian medical students. *Med Teach*. 2014;36(11):978–982. doi:10.3109/0142159X.2014.918256
45. Millan LR, Azevedo RS, Rossi E, De Marco OLN, Millan MPB, de Arruda PCV. What is behind a student's choice for becoming a doctor? *Clinics*. 2005;60:143–150. doi:10.1590/S1807-59322005000200011