

An Assessment of Admission-related Factors as Predictors of Academic Performance in a New Medical School

Oyenike Oyeronke EKEKEZIE

oyenike.ekekezie@hust.edu.ng

Hillside University of Science and Technology

Oluwafemi Emmanuel BABATUNDE

Hillside University of Science and Technology

Douglas Oboera EHIAKHAMEN

Hillside University of Science and Technology

Oluwadamilare Joseph AKINREMI

Hillside University of Science and Technology

Ayokunle Peter AYEMINIMOWA

Hillside University of Science and Technology

Babatunde Oladotun OSIDELE

Hillside University of Science and Technology

Mayokun Afolabi OJO

Hillside University of Science and Technology

Kamar Tayo ADELEKE

Hillside University of Science and Technology

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Abstract

Background

Admission into medical school is highly competitive, and the training that follows is rigorous and demanding. Identifying admission-related factors associated with early academic performance can help institutions select and support students who are most likely to succeed. This study assessed admission-related factors as predictors of academic performance among students in a newly established Nigerian medical school.

Methods

This descriptive cross-sectional study was conducted among all undergraduate medical students in 200 and 300 level at the School of Basic Medical Sciences, Tristate College of Medicine (Ibadan Campus), Hillside University of Science & Technology, Ekiti State, Nigeria. Sociodemographic and admission-related data were collected via a structured online questionnaire and institutional records between April and June 2026. The outcome variable was current academic performance (first-semester grade point average, GPA). Associations were tested using chi-square or Fisher's exact tests as appropriate; variables with $p < 0.2$ on bivariate analysis were entered into a multivariate logistic regression model.

Results

Of 69 eligible students, 68 (98.6%) participated. The mean age was 19.44 ± 2.63 years, and 67.6% were female. On bivariate analysis, type of secondary school attended ($p = 0.001$) and UTME score category ($p = 0.023$) were significantly associated with current academic performance: students who attended private secondary schools and those with UTME scores of at least 220 had higher performance. On multivariate analysis, students from public secondary schools had significantly higher odds of lower academic performance than those from private secondary schools (adjusted odds ratio [aOR] 8.92, 95% confidence interval [CI]: 1.63–48.77, $p = 0.012$), although the wide confidence interval reflects the small number of public-school students in this sample.

Conclusion

Type of secondary school attended and UTME score were associated with academic performance among medical students in this cohort, with secondary school type emerging as an independent, though imprecisely estimated, predictor. Admission processes that consider these indicators as part of a holistic evaluation of applicants may support the selection of students likely to succeed in medical training, pending confirmation in larger, multi-institutional samples.

Background

Medical education is rigorous worldwide, and admission processes are highly competitive as administrators aim to select the best candidates. Training in medical school is expensive, its duration exceeds that of most other courses, and its curriculum is voluminous. The philosophy of the Bachelor of Medicine and Bachelor of Surgery (MBBS) curriculum, as set out in the Core Curriculum and Minimum Academic Standards (CCMAS), is to produce twenty-first-century medical doctors equipped with the knowledge and skills to apply known and innovative approaches to the healthcare challenges facing society today and in the future, through competency-based and community-oriented training that emphasises social responsiveness, relevance, and life-long learning.¹

In Nigeria, the MBBS programme is typically six years in duration, culminating in the award of the MBBS degree on successful completion of all programme requirements. It comprises the preliminary Basic Sciences (100 level) for 12 months; the preclinical Basic Medical Sciences (200 level and part of 300 level) for 18 months; the Basic Clinical Sciences (part of 300 level and 400 level) for 12 months; and the Clinical Sciences for 30 months. These phases are not strictly compartmentalised, as they overlap slightly during training. The programme operates under the dual oversight of the National Universities Commission (NUC) and the Medical and Dental Council of Nigeria (MDCN).^{1–3}

Admission into Nigerian universities for medicine and other programmes is moderated by the Joint Admission and Matriculation Board (JAMB) and the individual universities via two main pathways: the Unified Tertiary Matriculation Examination (UTME) into the first year

(100 level), and Direct Entry (DE) into the second year (200 level).^{2–4} Candidates additionally require credit passes in five core subjects at the secondary school exit examination, or relevant 'A' level passes or a first degree in a relevant science, for the UTME and DE pathways respectively. On completion of 100 level, students with an appreciably high-grade point average (GPA) may also gain admission by transfer from other universities into 200 level.^{1,2}

Academic performance is a measure of students' achievement of short- or long-term educational goals, commonly defined by key metrics such as examination scores and GPA.⁵ Medical students at every level undergo several rounds of assessment, in addition to professional examinations that determine their progress through the programme. The first of four professional examinations follows the basic medical sciences (200 level and part of 300 level); as the gateway to clinical training, it is a high-stakes assessment.^{1–3} Many students have had their training truncated after being advised to withdraw from the programme on account of failing professional examinations, particularly this first gateway examination. This can be devastating for students, their families, and loved ones, and has been linked to depression, suicidal ideation, and suicide.^{6,7} Given the substantial physical, psychological, financial, and social investment involved, it is imperative that the admission-related factors that may influence students' academic performance and their eventual outcomes in medical education be closely monitored, so that only candidates capable of surmounting the rigours of medical training, in preparation for caring for patients with competence and the highest ethical and moral standards are selected.

This study therefore aimed to assess admission-related factors as predictors of current academic performance among students in a new medical school, as an early indicator of preparedness for the more demanding assessments that lie ahead, including the first professional examination. Findings from this study are valuable for the stakeholders of this new college, and of other colleges, in improving medical education: for faculty, in better preparing students ahead of the first professional examination; for administrators, in selecting the best-fit candidates; and for prospective students and parents, in making informed choices that may ultimately reduce premature withdrawal from the programme due to high failure rates, and reduce the social and psychological trauma associated with failure.^{8,9} Selecting students best suited to medical training may also reduce the proportion who do not outrightly fail but struggle through the phases of training and the professional examinations: an experience that is similarly traumatic and does not produce the best physicians.

Methods

Aim

To assess admission-related factors as predictors of academic performance in a new medical school.

Study design and setting

This descriptive cross-sectional study was carried out at the School of Basic Medical Sciences, Tristate College of Medicine (Ibadan Campus), Hillside University of Science & Technology (HUST), Okemesi-Ekiti, Ekiti State, Nigeria. HUST is a Federal Government-approved private university established in 2023.¹⁰

Study participants

This included all undergraduate medical students admitted in the 2023/2024 and 2024/2025 academic sessions who were in 200 and 300 level at the School of Basic Medical Sciences.

Sample size determination

The study was a total population survey of all medical students in 200 and 300 level. Eligible responses were received from 68 of the 69 students (98.6% response rate).

Data collection

Data were collected between April and June 2026. Sociodemographic information and admission-related data were obtained using a structured, online questionnaire administered via Google Forms, and from students' records; results of first-semester assessments for the 200- and 300-level students were similarly retrieved from academic records.

Study variables

Independent variables: admission-related variables (type of secondary education, mode of admission, West African Examinations Council [WAEC] scores, UTME scores, academic performance in 100 level) and sociodemographic variables (age group, gender, level of study, and monthly allowance).

Dependent variable: current academic performance.

Data analysis

Data exported from Google Forms via Google Sheets and Excel were analysed in IBM SPSS version 27 (IBM Corporation, Armonk, New York, United States). Descriptive statistics (frequencies and percentages) were used to summarise sociodemographic and admission-related data. Bivariate analysis using the chi-square test (or Fisher's exact test where expected cell counts were small) was used to test for significant associations between variables. Variables with a bivariate p-value < 0.2 were subsequently entered into a multivariate logistic regression model to identify predictors of academic performance.¹¹ Logistic regression was chosen as it is the preferred approach for identifying the best-fitting model for binary outcome data and provides consistent performance across a broad range of scenarios.^{12,13} Results are presented as adjusted odds ratios (aOR) with 95% confidence intervals (CI). A p-value < 0.05 was taken to indicate statistical significance.

UTME score was classified as ≥ 220 out of 400 (high) or < 220 out of 400 (low); academic performance in 100 level was classified as GPA ≥ 3.50 (high) or < 3.50 (low); and current academic performance (the outcome of interest) was classified as GPA ≥ 3.50 (high) or < 3.50 (low). Direct Entry and Transfer students, who by definition had no UTME score and no 100-level GPA obtained at this institution, were coded as 'Not applicable' for these two variables; this subgroup was retained in the Table 1 bivariate analyses to reflect the full study population but was excluded from the sub-analyses in Table 2, which examined associations only among the 42 UTME entrants for whom WAEC score, UTME score, and 100-level GPA were all available.

Monthly allowance was used as a proxy for socio-economic status and was classified as < ₦40,000 monthly (low socio-economic status), ₦40,000–₦80,000 monthly (middle socio-economic status), and > ₦80,000 monthly (high socio-economic status).

Minimisation of bias

To reduce social desirability bias, the questionnaire was anonymous and voluntary, and academic results were retrieved directly from students' academic records rather than self-report. Non-response bias was minimised by the high response rate.

Results

The majority of participants (73.5%) were aged 17–20 years, with an overall mean age of 19.44 ± 2.63 years. Most were female (67.6%), of Yoruba ethnicity (73.5%), Christian (88.2%), single (98.5%), and in 200 level (67.6%). The highest level of education for most students (76.5%) prior to admission was secondary education, while 11.8% had tertiary education; 79.4% had attended private secondary schools. Most students (92.6%) were studying medicine by choice, and their education was funded solely by their parents. Most (61.8%) were admitted via UTME, a quarter via DE, and 13.2% by transfer from other universities after 100 level. Half received more than ₦80,000 monthly as personal allowance.

Table 1
Association between socio-demographic and admission-related factors and current academic performance (n = 68)

Variable	Category	High n (%)	Low n (%)	Total n (%)	χ^2	P value
Age group	16–22 years	33 (54.1)	28 (45.9)	61 (100)		0.699 [†]
	> 22 years	3 (42.9)	4 (57.1)	7 (100)		
Gender	Female	24 (52.2)	22 (47.8)	46 (100)	0.034	0.855
	Male	12 (54.5)	10 (45.5)	22 (100)		
Level of study	200 level	27 (58.7)	19 (41.3)	46 (100)	1.890	0.169
	300 level	9 (40.9)	13 (59.1)	22 (100)		
Monthly allowance	Low	6 (42.9)	8 (57.1)	14 (100)	1.113	0.573
	Middle	10 (50.0)	10 (50.0)	20 (100)		
	High	20 (58.8)	14 (41.2)	34 (100)		
Type of secondary education	Private	34 (63.0)	20 (37.0)	54 (100)	10.574	0.001 [†]
	Public	2 (14.3)	12 (85.7)	14 (100)		
Highest level of education	Secondary	30 (57.7)	22 (42.3)	52 (100)		0.222 [†]
	A-level	4 (50.0)	4 (50.0)	8 (100)		
	Tertiary	2 (25.0)	6 (75.0)	8 (100)		
Mode of admission	UTME	23 (54.8)	19 (45.2)	42 (100)		0.287 [†]
	DE	6 (37.5)	10 (62.5)	16 (100)		
	Transfer	7 (70.0)	3 (30.0)	10 (100)		
WAEC score category	At least 1 'A'	17 (51.5)	16 (48.5)	33 (100)	0.052	0.819
	No 'A'	19 (54.3)	16 (45.7)	35 (100)		
UTME score category	≥ 220	18 (72.0)	7 (28.0)	25 (100)	7.513	0.023 [†]
	< 220	5 (29.4)	12 (70.6)	17 (100)		
	Not applicable	13 (50.0)	13 (50.0)	26 (100)		
Academic performance in 100 level	GPA ≥ 3.50	23 (60.5)	15 (39.5)	38 (100)		0.063 [†]
	GPA < 3.50	0 (0.0)	4 (100.0)	4 (100)		
	Not applicable	13 (50.0)	13 (50.0)	26 (100)		

[†] Fisher's exact p-value used. [‡] Significant (p < 0.05). 'Not applicable' denotes Direct Entry and Transfer students.

Type of secondary school attended (p = 0.001) and UTME score category (p = 0.023) were significantly associated with current academic performance: students who attended private secondary schools, and those who obtained a UTME score of at least 220, had significantly higher current academic performance. Higher current academic performance was also more common among students in the high monthly-allowance category, those whose highest level of education was secondary school, transfer students, and those with a GPA of at least 3.50 in 100 level; however, none of these associations reached statistical significance (all p > 0.05) (Table 1).

Table 2
Association between admission-related factors among UTME entrants (n = 42) a) UTME score category and academic performance in 100 level

Variable	Category	GPA ≥ 3.50 n (%)	GPA < 3.50 n (%)	Total n (%)	χ^2	P value
UTME score category	≥ 220	25 (100.0)	0 (0.0)	25 (100)	0.021 [†]	0.021 [†]
	< 220	13 (76.5)	4 (23.5)	17 (100)		

b) WAEC score category and academic performance in 100 level

Variable	Category	GPA $\geq$ 3.50 n (%)	GPA < 3.50 n (%)	Total n (%)	χ^2	P value
WAEC score category	At least 1 'A'	19 (100.0)	0 (0.0)	19 (100)	0.114	
	No 'A'	19 (82.6)	4 (17.4)	23 (100)		

c) WAEC score category and UTME score category

Variable	Category	$\geq$ 220 n (%)	< 220 n (%)	Total n (%)	χ^2	P value
WAEC score category	At least 1 'A'	13 (68.4)	6 (31.6)	19 (100)	1.140	0.353
	No 'A'	12 (52.2)	11 (47.8)	23 (100)		

– Fisher's exact p-value used. – Significant ($p < 0.05$).

UTME score category was significantly associated with academic performance in 100 level ($p = 0.021$): all 25 students who obtained a UTME score of at least 220 attained a GPA of at least 3.50 in 100 level. WAEC score category was not significantly associated with either academic performance in 100 level or UTME score category (Table 2).

Table 3
Admission-related factors as predictors of current academic performance among the respondents

Variable	Category	OR	B	aOR	95% CI Lower	95% CI Upper	P value
Type of secondary education	Private (ref.)	–	–	1	–	–	–
	Public	10.200	2.189	8.924	1.633	48.774	0.012–
Level of study	200 level (ref.)	–	–	1	–	–	–
	300 level	2.053	1.216	3.374	0.972	11.709	0.055
UTME score category	$\geq$ 220 (ref.)	–	–	1	–	–	–
	< 220	6.171	1.238	3.450	0.720	16.532	0.121
Academic performance in 100 level	GPA $\geq$ 3.50 (ref.)	–	–	1	–	–	–
	GPA < 3.50	N/E–	N/E–	N/E–	N/E–	N/E–	N/E–
	Not applicable	1.533	0.385	1.469	0.389	5.553	0.570

OR – crude odds ratio; B – regression coefficient; aOR – adjusted odds ratio; CI – confidence interval; N/E – not estimable. 'Not applicable' denotes Direct Entry and Transfer categories. – Significant ($p < 0.05$). – Not estimable because of quasi-complete separation: none of the four students with GPA < 3.50 in 100 level had high current academic performance (Table 1), so this category perfectly predicted the outcome and the corresponding odds ratio, coefficient, and confidence interval could not be reliably estimated by standard maximum-likelihood logistic regression. This estimate is therefore not reported numerically and should not be interpreted; re-analysis using penalised (Firth's) logistic regression, ideally in a larger sample, is recommended to obtain a stable estimate for this predictor.^{14,15}

On multivariate analysis, type of secondary school attended remained an independent predictor of current academic performance after adjusting for level of study, UTME score category, and academic performance in 100 level. Students who attended public secondary schools had significantly higher odds of lower academic performance than those who attended private secondary schools (aOR = 8.924, 95% CI: 1.633–48.774, $p = 0.012$); the width of this confidence interval, reflecting the small number of public-school students in the sample ($n = 14$), indicates that this estimate should be interpreted with caution. The corresponding estimate for GPA < 3.50 in 100 level could not be reliably determined because of quasi-complete separation arising from a zero-count cell (see Table 1 and footnote c) and is therefore not reported (Table 3).

Discussion

This study assessed admission-related factors as predictors of academic performance among students in a new medical school. The finding that students who attended private secondary schools had significantly better academic performance than those from public secondary schools suggests that differences in pre-university educational experience may influence subsequent success in medical school. After adjusting for other admission-related variables, students who attended public secondary schools had markedly higher odds of lower academic performance than those from private secondary schools, although the wide confidence interval around this estimate, driven by the relatively small number of public-school students in this sample, means it should be interpreted as indicative rather than precise. This pattern is nonetheless consistent with disparities in educational resources, teacher-to-student ratios, academic support systems, learning environments, and opportunities for intensive preparation for university entrance examinations, which are generally more available in many private secondary schools in Nigeria.^{16,17}

Studies conducted in some higher-income countries, however, have reported little or no influence of school type on university academic performance after controlling for prior academic ability and socioeconomic factors.¹⁷ These inconsistencies suggest that the influence of secondary school type may be context-dependent, reflecting variations in educational quality and resource distribution across countries.

This study also found a significant association between UTME score and academic performance. Students who obtained UTME scores of at least 220 were significantly more likely to demonstrate high current academic performance, and all students in this category achieved a GPA of at least 3.50 in their first year of study. This finding supports the usefulness of UTME scores as an indicator of academic preparedness for the rigours of medical education. Higher UTME scores may reflect stronger cognitive ability, better mastery of prerequisite science subjects, more effective study habits, and greater examination skills, all of which may contribute to sustained academic success during medical training. This observation is consistent with previous work reporting positive relationships between university entrance examination scores and subsequent academic performance among medical students; Ferguson et al. concluded that prior academic achievement remains one of the strongest predictors of future academic success in medical education,¹⁸ and Mwandigha et al. found that measures of prior academic attainment consistently predicted undergraduate and postgraduate medical performance.¹⁷ In contrast, Nwobodo et al. reported that Direct Entry students significantly outperformed UTME entrants in the First MBBS professional examinations, attributing this advantage to greater academic maturity, prior university exposure, and previous experience with rigorous tertiary-level assessment among Direct Entry students.¹⁹ Other studies have similarly demonstrated that higher UTME scores are associated with improved academic outcomes during undergraduate medical training.^{20–22} Together, these findings support the continued relevance of standardised admission examinations as part of the medical school selection process.

Contrary to expectations, WAEC score was not significantly associated with UTME score, first-year academic performance, or current academic performance. One possible explanation is that secondary school exit examination grades may not always accurately reflect students' true academic ability. In Nigeria, concerns have been raised about examination malpractice at some Senior Secondary School Certificate Examination (SSCE) centres, particularly the operation of so-called 'miracle examination centres', where candidates may obtain unmerited grades through unethical practices.^{6,23} Such practices could reduce the predictive validity of WAEC results as indicators of academic preparedness, although the present study did not directly assess examination malpractice. By contrast, the computer-based administration of UTME, together with its enhanced security measures and standardised testing procedures, may provide a more objective assessment of candidates' academic ability, which could help explain why UTME score, but not WAEC score, was significantly associated with academic performance in the present study.

In this study, students from higher-income households had better current academic performance, although the association was not statistically significant. This is broadly consistent with previous studies reporting that favourable socioeconomic conditions may enhance students' access to educational resources, learning materials, stable living conditions, and academic support, thereby facilitating academic success.^{24–26} Academic performance in medical school is influenced by multiple interacting factors, including learning strategies, motivation, self-regulation, resilience, and institutional support, and these factors may become increasingly important as students progress through training.²⁷

The estimate for prior (100-level) academic performance as a predictor of current performance could not be reliably determined in the multivariate model, because none of the four students with a 100-level GPA below 3.50 had high current performance. This zero-count cell produced quasi-complete separation, a well-recognised limitation of maximum-likelihood logistic regression in small samples with sparse categories. While this pattern is consistent with the strong bivariate association already suggested by Table 1 and Table 2, the corresponding regression estimate is not statistically interpretable and should not be used to draw conclusions about the independent

effect of prior GPA on current performance. Larger samples, or penalised regression methods such as Firth's logistic regression, would be needed to estimate this association reliably.

Limitations

- Self-reported data may under- or over-estimate some variables because of social desirability bias in a health-professional trainee population; however, this was mitigated by retrieving academic results directly from institutional records rather than by self-report.
- The cross-sectional design means that findings reflect associations rather than causation.
- The sample was drawn from a single, newly established medical school with only two admission cohorts (n = 68). This small sample size limited statistical power, particularly within some subgroups (for example, only 14 students had attended public secondary schools), and may limit the generalisability of these findings to other, more established medical schools.
- One predictor in the multivariate model (GPA < 3.50 in 100 level) could not be reliably estimated because of quasi-complete separation arising from a zero-count cell; this estimate was therefore not reported, and future studies with larger samples or penalised regression methods are needed to clarify this association.
- Current academic performance was assessed using in-course GPA at 200/300 level rather than actual performance in the first professional examination. While in-course GPA is a reasonable early proxy, longitudinal follow-up to professional-examination outcomes, once available for this cohort, would strengthen the predictive validity of these findings.

Conclusions

This study found that type of secondary school attended and UTME score were significantly associated with academic performance among medical students in a new medical school, with secondary school type emerging as an independent predictor, albeit one estimated imprecisely given the small number of public-school students in this sample. These findings suggest that standardised entrance examination scores, such as UTME, remain valuable indicators of students' academic preparedness and should continue to inform the admission process. However, because no single criterion can adequately predict academic success, medical schools should adopt a holistic admission approach that combines standardised examination performance with other relevant academic indicators. Other medical schools may wish to consider institution-specific minimum admission-score thresholds as part of such a holistic, evidence-informed process, pending replication of these findings in larger, multi-institutional samples.

Abbreviations

MBBS
Bachelor of Medicine and Bachelor of Surgery
CCMAS
Core Curriculum and Minimum Academic Standards
NUC
National Universities Commission
MDCN
Medical and Dental Council of Nigeria
JAMB
Joint Admission and Matriculation Board
UTME
Unified Tertiary Matriculation Examination
DE
Direct Entry
GPA
Grade Point Average
HUST
Hillside University of Science & Technology
WAEC
West African Examinations Council
SSCE

Declarations

Ethics approval and consent to participate:

The study was conducted in accordance with the Declaration of Helsinki. Ethics approval was obtained from the Health Research and Ethics Committee of the Lagos State University Teaching Hospital before the commencement of the study (LREC/06/26/3124). Permission to conduct the study was obtained from the Dean of Student Affairs of the University, and permission to obtain data from students' records and academic records was obtained from the Provost of the College. Informed written consent was obtained from each student via a section of the form preceding the questionnaire itself, without coercion, stating that participation was voluntary, with the potential benefit of increased health knowledge and no risk of physical harm. Confidentiality was maintained throughout the study: responses were anonymous, data were stored securely, no identifiable data were collected, and data access was limited to the research team.

Consent for publication:

Not applicable.

Competing interests:

The authors declare that they have no competing interests.

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Author Contribution

EO and BO conceptualized the study. EO, BO, and ED designed the study. All authors collected data. EO, BO, and ED analyzed the data. All authors read and approved the final manuscript.

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We acknowledge the office of the Dean of Student Affairs for permission to collect data.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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