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ORIGINAL RESEARCH

Determinants of academic performance in medical students: evidence from a medical school in south-east Nigeria

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Background: Medical education is considered one of the toughest college degrees to acquire. Exploring the factors that determine good academic performance in medical school will help in the planning of curriculum and assist students to navigate through medical school more effectively.

Methods: This cross-sectional and descriptive study enrolled 145 second year clinical students (500 level) of the Enugu State University of Science and Technology in south-east Nigeria using purposive and convenient sampling method. It assessed factors that predicted good academic performances in surveyed students.

Results: Medical students without membership in any campus group, those that receive(s) less than ten thousand naira (≈US$27) every month as upkeep allowance, those admitted through the University Matriculation Examination, and students who visit their families on a weekly basis were more likely to have better academic performances than those in corresponding categories. Of these significant predictors of good academic performance, mode of admission into medical school (Rs=−0.310 P=0.001) and monthly allowance students got for upkeep (Rs=−0.281 P=0.001) had the strongest correlation with good academic performances.

Conclusion: Our study identified factors that correlate with academic performances among medical students. We propose frequent appraisal of these factors and support system that will help improve performance in these students.

Keywords: medical student, academic performances, medical school, Enugu

Introduction

Medical education is challenging and expensive all over the world resulting in medical colleges aiming to recruit only the best applicants into its medical degree programs. This makes the admission process into medical school highly competitive. In the same way, the classroom and clinical curriculum in medical school are enormous and require a much longer period of study to cover all the program requirements. Thus, students accepted into medical school are expected at every level of their medical education to scale hurdles ranging from post-course assessments, various professional examinations, and clinical assessments in the form of actual patient encounters, objective structured clinical examination (OSCE), and oral clinical examination. These rigorous training standards are believed would ensure molding of medical students into medical doctors who not only will be able to manage patients with optimal ethical and moral standards as required by the

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professional oath but that can also withstand the stress of the medical profession. Achievement of this ultimate status largely depends on the academic performance of the student at every examination during their medical training. Failure to consistently achieve good academic grades usually leads to ultimate dismissal from medical school. According to Cambridge university reporter, academic achievement refers to the ability to achieve a pass grade in an examination and/or attain grades above the minimum acceptable GPA in an educational program.[1] Several studies have documented the effect of academic styles, behavioral, and social factors on academic performance of medical students.[2–5] There is however paucity of researches on this subject in our setting. The purpose of this study is to ascertain factors that determine the academic performances among medical students in south-east Nigeria. It is hoped that understanding predictors of good academic performances among medical students will not only add to the existing body of knowledge on this subject but also assist in the development of programs that will address these issues to improve academic performance among students.

Pre-study hypotheses

1. Academic performance of medical students of College of Medicine of the Enugu State University is affected by local sociodemographic factors.
2. Some locally prevalent curricular and extracurricular activities affect academic performance of medical students of the Enugu State University.

Methodology

This was a cross-sectional and analytical study conducted over a 6-month period between March to September 2018 in College of Medicine, Enugu State University of Science & Technology located in Enugu, south-east Nigeria. The university is one of the two tertiary institutions in the state that is accredited to offer the Bachelor of Medicine and Bachelor of Surgery (MBBS) degree program to qualified students.

Study participants and selection process

The medical students of the Faculty of Clinical Medicine in the College of Medicine of the Enugu State University were recruited for this study. The MBBS program is typically a 6-year program that results in the award of the MBBS degree certificate after successfully completing all the program requirements. The program is divided into the pre-clinical (100–300 levels) and clinical (400–600 levels) phases. In the pre-clinical phase, basic medical sciences: Anatomy, Physiology, and Medical Biochemistry are taught, and students are required to sit for the 2nd MBBS professional examination at the end of 3 years. A pass in all three subjects is mandatory to advance to the clinical phase of the program.

In the first year of the clinical phase (400 levels), Pharmacology and Pathology (consisting of Chemical Pathology, Hematology, Microbiology, and Histopathology) are the subjects of study. This culminates to the 3rd MBBS professional examination. A pass in both subjects is required to advance to the second year of the clinical phase (500 levels). In the second clinical year, students enroll for the Paediatrics, Community Medicine, and Obstetrics & Gynaecology courses for another academic session. In addition to classroom lectures, students also acquire clinical experience via rotational postings through clinical units of Pediatrics, Community Medicine, and Obstetrics & Gynaecology departments in the Teaching Hospital. Each clinical unit consists of Consultants, Senior registrars, Registrars, and House-officers. After successful completion of the second clinical year through passing of the 4th MBBS professional examination, student moves to the final clinical year (600 level). At this level, they take two subjects, namely; Internal Medicine and Surgery. Successful completion of this level leads to the award of the MBBS degree.

The second clinical year (500 level) was chosen for this study by purposive sampling method. Selection of this class set was based on two reasons. First, the surveyed students were on their pediatric posting at the time of this study; thus, they were easily accessible to the principal investigator who is a physician in the Department of Pediatrics. Second, because they have sat for two professional examinations (ie, second and third MBBS examinations), it was easier to have a less biased assessment of their overall academic performances in medical school. Selection of the actual study participants was done using the convenient sampling method. Students who gave consent to participate were consecutively enrolled. Participation in the study was entirely voluntary and no form of inducement was involved. Verbal informed consent was obtained from each of the students before enrollment and participants were assured they can withdraw at any stage of the study. Ethical approval was obtained from the Research and Ethics Committee of Enugu State University before the commencement of data collection.

Data collection

Data collection was via self-administered questionnaire and information collected included independent variables which are summarized in Table 1. These variables included sociodemographic parameter of students, curricular activities, and extracurricular activities engaged by students. This was collected in the relevant section of the questionnaire and were categorized as follows:

Sociodemographic parameters

i) Age – <25, ≥25 years; ii) Gender – male, female; iii) Marital status – married, single; iv) Ethnicity – Igbo, others; v) Religion – Christianity, others; vi) Family size – <5, 6–7, >7; vii) Family problems during study year – yes; no viii) Financial Dependents – yes, no ;ix) Monthly allowance (in Naira) – ≤10,000, 10,000–20,000, 21,000–40,000, >40,000; x) Mode of admission – University Matriculation Examination (UME), inter-departmental, inter-university, direct entry; xi) Number of UME sitting 1, 2, 3, >3; xii) Medical school entry – merit-based, quota based, not applicable.

Curricular activities and extracurricular activities

i) Membership of school organizations – none; 1, 2, ≥3; ii) Number of non-academic activities per week – none, 1, 2, ≥3; iii) Frequency of family visit – weekly or less, monthly, bimonthly, quarterly or more; iv) Main

Table 1 Summary of measure used in the categorization of surveyed medical students

Variables	Measures
Categorization of the sociodemographic characteristics of medical students	
Age	<25 years, ≥25 years
Gender	Male, female
Marital status	Married, single
Ethnicity	Igbo, others
Religion	Christianity, others
Family size	<5, 6–7, >7
Family problems	Yes, no
Financial dependents	Yes, no
Monthly allowance in naira[a]	≤10,000, 10,000–20,000, 21,000–40,000, >40,000
Mode of admission	UME, inter-dept, inter-uni, direct entry
Number of UME sitting	1, 2, 3, >3
Medical school entry	Merit-based, quota-based
Categorization of the curricular and extracurricular activities in medical school	
Membership of school groups	None, 1, 2, ≥3
Number of non-academic activities per week	None, 1, 2, ≥3
Frequency of family visit	Weekly, monthly, bimonthly, quarterly or less
Main extracurricular activity	Sport, social, politics, others
Effect of extracurricular on academic performance	Enhance, diminish, no effect, not sure
Preferred method of teaching	Oral and note taking, power-point, others
Number of study hour per day	<4 hrs, ≥4 hrs
Number of study hour on weekends	<5 hrs, 5–8 hrs, >8 hrs
Number of hours on social media/networking	<2 hrs, ≥2 hrs
Number of hours of sleep per day	<6 hrs, 6–8 hrs, >8 hrs
Preparation prior to major examinations	≤1 month, >1 month
Dimensions measuring the academic performances of medical students	
Number of sitting to pass 2nd MBBS Exam	1, ≥2
Number of sitting to pass 3rd MBBS Exam	1, ≥2
Number of repeated examinations till date	None, 1, 2, ≥3
Number of distinctions	None, 1, ≥2
Academic performance (Cronbach α=0.74)	Good, poor

Note: [a]One US dollar = 362 nigerian naira (http://www.xe.com).
Abbreviations: UME, University Matriculation Exam; inter-dept, inter-departmental; inter-uni, inter-university.

extracurricular activity – indoor and/or outdoor sport, social, politics, others; v) Perceived effect of extracurricular on academic performance – enhance, diminish, no effect, not sure; vi) Preferred method of teaching – oral and note taking, power-point, others; vii) Number of study hour per day – <4 hrs, ≥4 hrs; viii) Number of study hour on weekends – <5 hrs, 5–8 hrs, >8 hrs; ix) Number of hours on social media/networking – <2 hrs, ≥2 hrs; x) number of hours of sleep per day – <6 hrs, 6–8 hrs, >8 hrs; xi) Duration of preparation prior to major examinations – ≤1 month, >1 month.

Measure

The outcome variable was the academic performances of medical students. For the sake of our study, this variable was created and operationalized using four dichotomized outcome variables. These included: i) Number of sitting to pass 2nd MBBS professional examination, a dichotomous variable grouped as "1" (for student who challenged and passed the second MBBS professional examination in one sitting) or "≥2" (for student who challenged and passed the second MBBS professional examination in more than one sitting); ii) Number of sitting to pass third MBBS exam, also a dichotomous variable grouped as "1" (for student who challenged and passed the third MBBS professional examination in one sitting) or "≥2" (for student who challenged and passed the third MBBS professional examination in more than one sitting); iii) Number of repeat examination (commonly called "resit"), a multi-variate variable grouped as "none" (for student who has never had a resit), "1" (for student who has had only one resit), "2" (for student who has had two resits), and "≥3" (for student who has had three or more resits). For ease in creating the composite variable, this was re-categorized into a dichotomous variable grouped as none and ≥1 resits; iv) Number of distinctions, a multi-variate variable was initially grouped as "none" (for student who has never had a distinction), "1" (for student who has had one distinction), and "≥2" (for student who has had two or more distinctions). This was also re-categorized to none and ≥1. The resultant composite outcome variable had a Cronbach alpha of 0.74 and was subsequently re-categorized into good and poor academic performances. See Table 1.

Data analysis

All the data obtained were recorded in Microsoft Excel 2010. The Chi-square analysis was used to assess initial associations between the independent and outcome variables. Binary logistic regression analysis was later used to predict how the significant parameters on chi-square analysis determine academic performances in surveyed students. Measures of this association were presented as odds ratios (OR) and 95% confidence intervals (95% CI). Data analysis was done using IBM® SPSS version 21 (SPSS Inc, Chicago, IL) and statistical significance was set at $P \leq 0.05$. Respondents with grossly missing information were excluded from the data analysis.

Results

Characteristics of study respondents

One hundred and forty-eight medical students out of the 161 in the second clinical year consented to participate in the study. Of these, 145 were successfully enrolled resulting in a recruitment fraction of 98.6%. Three participants had grossly incomplete data and were excluded from the data analysis. Table 2 shows the summary characteristics of the respondents. About two-thirds (68.3%) were 25 years old or younger. Male:female ratio was approximately 1.2:1 while 88.3% were unmarried. Almost all respondents were Igbos (96.6%) and practice Christianity as their main religion (98.6%). Close to half of the respondents (45.5%) were from families of 5–7 siblings and 36.5% of them have had one or more major family problem during their course of medical education. Some of these family issues included drastic financial downturn of family income (36%), chronic disease in a first-degree relative (16%), divorced parents (12%), death of a first-degree relative (12%), and other unspecified problems (24%). Twenty-six (17.9%) of respondents are mostly self-sponsored students and 19.1%, 37.6%, 26.2%, and 17.0% have a monthly upkeep allowance of less than N10,000 (≈US$ 27), N10,000–20,000 (≈US$ 27–55), N21,000–40,000 (≈US$ 58–110), and more than N40,000 (≈US$110), respectively. One hundred (69%) of the 143 respondents were admitted through the UME with 89/100 (89%) and 11/100 (11%) of these being merit- and quota-based entry respectively.

Curricular and extracurricular activities of respondents

Table 3 shows a summary of curricular and extracurricular activities engaged by surveyed students. Majority (83%) of the students preferred class lectures delivered via power-point and shared digitally than oral presentation with note taking (9%). Nearly equal proportion spend <4 hrs (58%) and ≥4 (48%) hours per day studying during week-days

Table 2 Sociodemographic characteristics of medical students surveyed in the study

Characteristics	Variables	Number	Percentage
Respondents age (n=145)	<25 years	99	68.3
	≥25 years	46	31.7
Respondents gender (n=145)	Male	79	54.5
	Female	66	45.5
Marital status (n=145)	Married	17	11.7
	Single	128	88.3
Respondents ethnicity (n=145)	Igbo	140	96.6
	Others	5	3.4
Respondents religion (n=145)	Christianity	143	98.6
	Others	2	1.4
Family size (n=143)	<5	48	33.5
	5–7	65	45.5
	>7	30	21.0
Major family problem in the course of medical school (n=143)	Yes	50	36.5
	No	87	65.5
Monthly allowance (n=141)	<10,000	27	19.1
	10,000–20,000	53	37.6
	21,000–40,000	37	26.2
	>40,000	24	17.0
Financial dependents(s) (n=144)	Yes	21	14.6
	No	123	85.4
Mode of admission into medical school (n=145)	UME	100	69.0
	Inter-dept transfer	8	5.5
	Inter-univ transfer	25	17.2
	Direct entry	12	8.3
Entry into medical school (n=145)	Merit-based	89	61.4
	Quota-based	11	7.9
	Not applicable	45	30.7

Abbreviation: UME, University Matriculation Examination.

while 50 (35%), 63 (44%), and 30 (21%) respectively, spend a total of <5 hrs, 5–8 hrs, and >8 hrs studying during the weekends. Sixty-nine percent of respondents say they need more than 1 month to prepare for examinations while the remainder (31%) prepares in 1 month or less. Mode of studying for examinations included reading lecture materials only in 132 out of the 503 multiple responses (23.0%), discussion with friends 97/503 (16.9%), practice past questions 80/503 (14.0%), touching and exploring models 16/503 (2.8%), listening to videos 52/503 (9.1%), drawing & using picture books 22/503 (3.8%), reading lecture notes with textbook references 93/503 (16.2%) and 81/503 (14.2%) prefer studying alone. Motivation for studying among the surveyed students included to pass and obtain high scores in examinations and other tests in 95 of the 205 multiple responses (46.3%), being a medical student 35/205 (17.0%), pressure from family to graduate on time 41/205 (20.0%), to get a scholarship and graduate with good grades 12/205 (5.9%), and no motivation (ie, studying because it has to be done) 22/205 (10.8%). One hundred and fourteen of surveyed students (80%) and 107 (77%) passed the 2nd and 3rd MBBS examinations after 1 attempt while 20% and 23% passed the respective examinations following 2 or more attempts. Seventy-three medical students (51%) have never had to retake any of both MBBS examinations and 16 students (11%) have had at least one distinction in their medical education.

Table 3 Tabulation of the curricular-related and extracurricular activities of surveyed medical students

Curricular-related activities	Frequency N (%)	Extra-curricular activities	Frequency N (%)
Preferred teaching method	N=145	Time spent online on social networking	N=140
Oral with note-taking	12 (8)	< 2 hours per day	98 (70)
Power-point	120 (83)	≥ 2 hours per day	42 (30)
Others	13 (9)		
		Sleep hours per day	N=144
Study hours per day	N=144	< 6	52 (36)
<4	83 (58)	6-8	82 (57)
≥4	61 (42)	> 8	10 (7)
Study hours per weekends	N=143	Membership of campus groups	N=145
<5	50 (35)	None	34 (23)
5-8	63 (44)	1	76 (52)
>8	30 (21)	2	24 (17)
		≥ 3	11 (8)
Examination preparation period	N=142		
≤1 month	44 (31)	Number of activities attended per week	N=145
>1 month	98 (69)	None	50 (34)
		1 per week	60 (41)
Number of sitting for 2nd MBBS exam	n=143	2 per week	26 (18)
Once	114 (80)	>3 per week	9 (7)
Twice or more	29 (20)		
		Frequency of family visit	N=145
Number of sitting for 3rd MBBS exam	N=139	Weekly basis or less	42 (29)
Once	107 (77)	Monthly basis	22 (15)
Twice or more	32 (23)	Bimonthly basis	22 (15)
		Quarterly basis or less	59 (41)
Number of distinctions	N=144		
None	128 (89)	Main extra-curricular activity	N=118
1	10 (7)	Sports (indoor and/or outdoor)	61 (52)
≥2	6 (4)	Visiting or social gatherings	41 (34)
		Politics	9 (8)
Number of resits examinations	N=144	Others	7 (6)
None	73 (51)		
1	29 (20)	Effect of extra-curricular activities	N=112
2	35 (24)	Improves academic performance	46 (42)
≥3	7 (5)	Reduces academic performance	5 (4)
		No effect on academic performance	43 (38)
		Not sure	18 (16)

Slightly more than half of the students (52%) belonged to one group within the campus. Twenty-three percent (23%) had no membership of groups within campus while 11 students (8%) belonged to 3 or more groups. Relatedly, majority of the students (41%) attended one non-academic activity per week while 50 (34%) and 35 (25%) attended no activity and 2 or more activities per week, respectively. Two out of 5 (41%) traveled to visit family 4 times a year or less frequently and 42 students (29%) visited families on weekly basis and/or more frequently. The main extracurricular activities engaged by students included sports (52%), visiting or social gatherings (34%), politics (8%), and others (6%) such as reading novels, volunteering, short hour jobs, etc. There were various combinations of extracurricular activities students engaged in. Forty-six (42%) of the surveyed students believed these activities enhance their academic performances, 5 (4%) said it decreases while 43 (38%) believe

extracurricular activities have no effect on their academic performances. Eighteen students (16%) were not sure of the effect on their performances. About one-third of the student spend 2 hrs or more every day on non-academic-related social browsing on the Internet while the remaining 70% spend less than 2 hrs. Lastly, 52 (36%), 82 (57%), and 10 (7%) students sleep on the average for <6 hrs, 6–8 hrs, and >8 hrs respectively (Table 3).

Determinants of academic performances in surveyed students

Table 4 shows a chi-square analysis of academic performance and students factors considered in this study. Gender of respondents (P=0.050), number of memberships in campus groups (P=0.018), frequency of family visits (P=0.027), and amount of monthly allowance (P=0.010) were significantly associated with student's academic performance. Other significant determinants included mode of admission into medical school (P=0.001) and time spent on social media and/or networking (P=0.017). Of these significant factors, mode of admission into medical school (R_s=−0.310 P=0.001), and monthly allowance students get for upkeep (R_s=−0.281 P=0.001) had the strongest correlation coefficient with academic performances. Others include Gender of respondents (R_s=0.160 P=0.057), memberships in campus groups (R_s=0.052 P=0.054), frequency of family visits (R_s= −0.225 P=0.007), and time spent on social media (R_s=0.203 P=0.016). Gender of respondents, AOR 6.66 (95% CI 0.84–52.9; P=0.073), and time spent on social media, AOR 1.24 (95% CI 0.20–7.90; P=0.820), lost significant association with academic performance of surveyed students on adjusted logistic regression analysis after controlling for confounders of interest (ie, age, type of primary and secondary school attended, study hours per day, family problems, financial dependents, family size, marital status, religion, and ethnicity). See Table 5. However, students in one campus group, AOR 0.61 (95% CI 0.04–0.95; P=0.046), two campus groups, AOR 0.03 (95% CI 0.01–0.15; P=0.004), and three or more campus groups, AOR 0.04 (95% CI 0.02–0.54; P=0.028), were less likely to have a good academic performance compared to those who belonged to no campus group. Similarly, students that get 21,000–40,000 naira every month were 0.13 times less likely to have good academic performances compared to those that get less than 10,000 naira as monthly upkeep, AOR 0.13 (95% CI 0.01–0.27; P=0.005). The other sub-variables in this category did not attain statistical significance. Furthermore, medical students admitted into medical school through direct entry AOR 0.02 (95% CI 0.01–0.05; P=0.001) and those that entered through inter-departmental and inter-university transfer AOR 0.05 (95% CI 0.01–0.14; P=0.002) were less likely to have a good academic performance compared to those admitted through the UME. Finally, students who visit their families more frequently were more likely to have better academic performances. Compared to those who visit their family quarterly or less often, students who visit their family on a weekly or more frequent basis were 3.76 times more probable to have a good academic performance. Other subvariants in this category had no significant predictive association with good academic performance among surveyed students.

Discussion

We proceeded with this study based on the evidence that study habits, behavioral, and social factors can affect the academic performance of medical students.[2–5] We found that the mode of admission into medical school and the monthly allowance to students for upkeep had the strongest correlation coefficient with academic performance, a finding that illustrates the impact of socioeconomic factors on academic performance.[6] It was observed in this study that students that gained entry into medical education through the UME were more likely to perform better than those who entered via direct entry and inter-departmental transfers. The finding agrees with that of Olaleye and Salami[7] but contrary to another study that concluded that UME scores were unreliable indicators of future performance in Medical School.[8] Unlike our study, the latter study was conducted among students in their second year of medical education; thus, they might not have been adequately exposed to medical examinations well enough to unbiasedly assess their academic performance. We believe that since universities pick applicants with the highest scores in the university matriculation examination for its medical programs, it is fair to assume that these students will most likely continue in their stellar performances through medical school compared to those who entered the medical program through less competitive means such as inter-departmental transfers and direct entry programs.

Furthermore, it was noted that medical student with lower monthly allowances did significantly better than

Table 4 Determinants of academic performance in surveyed medical students

Parameter	Variables	Academic performances n (%)		*P*	Correlation coefficient (*Rs*)	*P*
		Good	Poor			
Respondents age (N=143)	≤25 >25	50 (64) 28 (36)	53 (76) 17 (24)	0.069	−0.151	0.071
Respondents gender (N=143)	Male Female	45 (62) 28 (38)	32 (42) 38 (58)	0.050*	0.160	0.057
Family size (N=141)	<5 5–7 >7	22 (31) 31 (43) 19 (26)	25 (36) 33 (48) 11 (16)	0.313	−0.111	0.208
Religion (N=140)	Christianity Others	72 (99) 1 (1)	69 (99) 1 (1)	0.976	0.002	0.956
Ethnicity (N=143)	Igbo Others	72 (99) 1 (1)	66 (94) 4 (6)	0.157	0.118	0.160
Membership of campus groups (N=143)	None 1 2 ≥3	24 (33) 30 (41) 12 (16) 7 (10)	10 (14) 46 (66) 10 (14) 4 (6)	0.018*	0.052	0.054
Number of activities attended (N=143)	None 1 per week 2 per week >3 per week	33 (45) 24 (33) 13 (18) 3 (4)	17 (24) 34 (49) 13 (19) 6 (9)	0.051	0.184	0.021
Marital status (N=143)	Married Single	11 (15) 62 (85)	6 (9) 64 (91)	0.303	0.100	0.233
Frequency of family visits (N=143)	Weekly or less Monthly Bimonthly Quarterly or less	16 (22) 9 (12) 9 (12) 39 (54)	25 (36) 12 (16) 13 (19) 20 (29)	0.027*	−0.225	0.007
Major family problem(s) (N=135)	Yes No	20 (29) 48 (71)	28 (42) 39 (58)	0.133	−0.129	0.135
Monthly allowance (N=140)	<10,000 10,000–20,000 21,000–40,000 >40,000	9 (13) 23 (44) 23 (21) 17 (27)	18 (27) 30 (44) 14 (21) 6 (9)	0.010*	−0.281	0.001
Financial dependents(s) (N=142)	Yes No	20 (12) 48 (88)	12 (17) 57 (83)	0.396	−0.071	0.399
Mode of admission (N=143)	UME Direct entry Others	39 (5) 11 (15) 23 (32)	59 (84) 1 (2) 10 (14)	0.001*	−0.310	0.001
Entry method (UME) (N=100)	Merit-based Quota-based	40 (89) 5 (11)	49 (89) 6 (11)	0.974	−0.003	0.975
Study hours per day (N=142)	<4 ≥4	45 (62) 28 (38)	37 (54) 32 (46)	0.334	0.081	0.963

(*Continued*)

Table 4 (Continued).

Parameter	Variables	Academic performances n (%)		*P*	Correlation coefficient (*Rs*)	*P*
		Good	Poor			
Study hours per weekends (N=141)	<5 5–8 >8	29 (40) 32 (44) 12 (16)	21 (31) 30 (44) 17 (25)	0.362	0.117	0.167
Exams preparation period (N=140)	≤1 month >1 month	17 (23) 56 (77)	25 (37) 42 (63)	0.070	−0.153	0.071
Sleep hours per day (N=142)	<6 6–8 >8	21 (29) 47 (64) 5 (7)	29 (42) 35 (51) 5 (7)	0.232	−0.120	0.156
Time spent online on social networking (N=138)	<2 hrs/day ≥2 hrs/day	57 (79) 15 (21)	40 (61) 26 (39)	0.017*	0.203	0.016

Note: *Statistically significant.
Abbreviation: UME, University Matriculation Examination.

Table 5 Binary logistic regression analysis of significant parameter and student's academic performance

Parameter	Variables	Crude OR (95% CI)	*P*-value	Adjusted OR (95% CI)[a]	*P*-value
Gender	Male Female	1 7.14 (1.81–28.2)	– 0.005*	1 6.66 (0.84–52.9)	– 0.073
Membership of campus groups	None 1 2 ≥3	1 0.78 (0.14–4.45) 0.19 (0.02–1.60) 0.28 (0.15–5.31)	– 0.783 0.125 0.398	1 0.61 (0.04–0.95) 0.03 (0.00–0.15) 0.04 (0.00–0.54)	– 0.046* 0.004* 0.028*
Monthly allowance	<10,000 10,000–20,000 21,000–40,000 >40,000	1 0.57 (0.13–2.55) 0.06 (0.01–0.35) 0.09 (0.01–0.74)	– 0.460 0.002* 0.025*	1 0.14 (0.02–1.39) 0.13 (0.01–0.27) 0.25 (0.01–11.3)	– 0.085 0.005* 0.478
Mode of admission	UME Direct entry Others	1 0.03 (0.01–0.17) 0.19 (0.05–0.70)	– 0.001* 0.013*	1 0.02 (0.01–0.05) 0.05 (0.01–0.14)	– 0.001* 0.002*
Time on social media/networking	<2 hrs/day ≥2 hrs/day	1 1.16 (0.32–4.20)	– 0.825 –	1 1.24 (0.20–7.90)	– 0.820 –
Frequency of family visits	Weekly or less Monthly Bimonthly Quarterly or less	4.34 (1.08–17.5) 0.19 (0.03–1.28) 4.06 (0.87–19.1) 1	0.038* 0.090 0.074 –	3.76 (2.91–48.5) 0.58 (0.17–1.99) 1.89 (0.65–5.56) 1	0.005* 0.762 0.061 –

Notes: [a]Adjusted for age, type of primary and secondary school attended, study hours per day, family problems, financial dependents, family size, religion, and ethnicity. *Statistically significant.

those with higher upkeep allowance. This is contrary to many studies that have shown that students from lower socioeconomic backgrounds and those with less financial support fared worse academically compared to their peers.[9,10] While we lack an appropriate explanation for this finding, we speculate that the less financial capability a medical student has, the less probable s/he would be engaged in extracurricular activities, hence the more likely s/he would focus on academic-related activities. This reasoning was given some credence by the finding in this study which showed that students who were not involved in any campus groups (ie, social activities) performed

better academically than those involved in one or more campus activities. Medical education curriculum is enormous with limited allotted time; hence, sharing this limited time with extracurricular activities will likely reduce the time the student will devote to studying and carrying out relevant academic work which will in turn adversely affect overall academic performance. However, we propose more studies with more participants to answer this question.

Our study also revealed that students who visited their families more frequently were more likely to perform better academically than their counterparts that visited families less often. This finding is supported by finding in several similar studies. Contrary to our study, however, it has been suggested that social support in general is related to lower levels of academic performance for students and so it may be more appropriate for medical schools to promote time-management strategies than support-building interventions.[11] When it came to modes of studying and gathering information, we found that students prefer information to arrive in a variety of modes which is consistent with the findings of a study by Cortright et al.[12]

There is published evidence to suggest that time spent on social media seems to have no influence on academic performance[13,14] which is consistent with the findings of our study. Conversely, other studies have shown social media affected the academic performance of students negatively.[15,16] However, social media has been described as a two-edge sword because of the benefits that students can harness from social media networks such as sharing of information, partaking in group discussions, and the dangers of addiction and distraction of attention which could have serious consequences on the academic life of students.[17]

This study is limited by our criteria for assessing academic performance in surveyed students which was a composite variable based on the feedback from the medical students which was not verified by viewing official results. This may have been a potential source of bias due to the possible unwillingness of some respondents to admit they failed and repeated examinations. Thus, there may have been some misclassification of students based on their academic performance.

Conclusion

Our study identified motivations and behaviors that correlate with academic performances among medical students. We propose frequent appraisal of these factors and support systems that will help improve performance in these students.

Ethics approval and consent to participate

Ethical approval was obtained from the Ethics and Research Committee of the College of Medical Sciences, Enugu State University of Science and Technology. Participation in the study was entirely voluntary, and no financial inducement whatsoever was involved. Participants were informed in writing that voluntary withdrawal at any stage of interaction was guaranteed for them without any adverse consequence. All information was handled with strict confidentiality.

Availability of data and material

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

Limitation of the study

The second-year clinical students used in this study have not completed the compulsory professional examinations in medical school; hence, their current academic performance may not completely represent their final academic status. Again there is a probability of some participating students not to indicate poor performance as no one is comfortable identifying with failures.

Abbreviations

OSCE, objective structured clinical examination; GPA, grade point average; MBBS, Bachelor of Medicine and Bachelor of Surgery; UME, University Matriculation Examination; SPSS, Statistical Package for Social Sciences.

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Author contributions

All authors made substantial contribution to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspect of the work.

Disclosure

The authors report no conflicts of interest in this work.

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