

## **IMPACT OF PRE-ADMISSION PRINCIPLES AND SCOCIO-ECONOMIS CHARCTERISTICS ON MEDICAL STUDENTS ACADEMIC PERFORMANCE AT GEZIRA UNIVERSITY**

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## Abstract

**Background:** Once the students enrolled to the medical colleges, their performance fluctuates. Few published data are presently workable. We desire to learn enough about the determinants of medical students' success.

**Methods:** a cross-sectional analysis, conducted in the Faculty of Medicine–University of Gezira in 2017. Comparing between students with low and high academic achievement against pre-admission principles and socio-economic attributes.

**Results:** Total number of students engaged are 73, twelve with low CGPA and 61 with high CGPA. boys and girls represented uniformly to their percentage in the patch with dominance of girls. General admission to the university, Sudanese 2ndry school certificate, and secondary school exam attempts are positively influence student academic performance. Also, disease or disability in the student, father profession and presence of a physician in the family, gets major impact on students' achievement. Meanwhile, student gender, marital status, English competence, disability in a family, economic background, family size, place of living, parents' education level and mother profession have no important part in academic student's performance, however, these factors showed some differences.

**Conclusion:** Many factors affect students' academic achievement, direct personal care and advice towards students with chronic illnesses and disabilities required. The role of academic supervisor requires activation, as they can change some of these important factors. In my community, further studies required to decide about private admission to medical schools.

**Keywords:** medical student, performance, socio-economic, preadmission, Sudan.



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## ملخص الدراسة

**الخلفية:** بمجرد تسجيل الطلاب في الكليات الطبية ، يتقلب ادواؤهم. قليل من البيانات المنشورة حاليا قابلة للتطبيق. نرغب في معرفة ما يكفي من محددات نجاح طلاب الطب.

**الطرق:** تحليل مقطعي تم اجراؤه في عام 2017. مقارنة بين الطلاب ذوي التحصيل الدراسي المنخفض والعالي مقابل مبادي ما قبل القبول والخصائص الاجتماعية والاقتصادية.

**النتائج:** اجمالي عدد الطلاب المشاركين 73، 12 طالبا بمعدل تراكمي منخفض و 61 طالبا بمعدل تراكمي مرتفع. يمثل الاولاد والبنات بشكل موحد نسبتهن في الدفعة مع هيمنة البنات. يؤثر القبول العام في الجامعة، والشهادة الثانوية السودانية وعدد مرات الجلوس لها بشكل ايجابي علي الاداء الاكاديمي للطلاب. كما ان المرض والاعاقة لدي الطالب ومهنة الاب ووجود طبيب بالاسرة لها تأثير كبير علي تحصيل الطلاب. وفي الوقت نفسه، فان جنس الطالب وكفاءة اللغة الانجليزية والاعاقة في الاسرة والخلفية الاقتصادية وحجم الاسرة ومكان المعيشة ومستوي تعليم الوالدين ومهنة الام ليس لها دور في اداء الطلاب الاكاديمي، ومع ذلك اظهرت هذه العوامل بعض الاختلافات.

**الخلاصة:** هناك العديد من العوامل التي تؤثر علي التحصيل الدراسي للطلاب، تتطلب العناية الشخصية المباشرة وتقديم المشورة للطلاب المصابين بامراض مزمنة واعاقات. يتطلب تفعيل وتنشيط دور المشرف الاكاديمي، حيث يمكنه تعديل بعض هذه العوامل المهمة. في مجتمعي يلزم اجراء المزيد من الدراسات لاتخاذ قرار بشأن القبول الخاص في كليات الطب .

**الكلمات المفتاحية:** طلاب الطب، الاداء الاكاديمي، الحالة الاجتماعية والاقتصادية، قبل القبول، السودان.

## Introduction:

prediction of associate elements of academic performance is a critical topic in psychological researches. (Colom, Escorial, Shih, & Privado, 2007) academic performance of medical students depends on cognitive like, pre-admission tests ranks and non-cognitive factors as, personal characteristics, learning strategies and institutional/curricular factors. (Elmadhoun & Elsanousi, 2014; Ferguson, James, & Madeley, 2002)

A wealth of factors contributes to academic performance at medical school, including quality of life, self-motivation, family income, parents' level of education and presence of physicians in the family. (Alfayez, Strand, & Carline, 1990; Lumley, Ward, Roberts, & Mann, 2015; Sirin, 2005; Zimmerman, Bandura, & Martinez-Pons, 1992) But these relationships are contingent upon several factors it is nearly impossible to predict academic performance using socioeconomic status. (Mlambo, 2011) Socioeconomic status affects educational opportunities and outcomes which explains, in part, why most medical students come from the upper two quintiles of family income (Moses & Thakre). A two-factor SES indicator based on parental education (E) and occupation (O) has recently established by the Association of American Medical College (AAMC) (Grbic, Jones, & Case, 2015)

female medical students outnumbered male medical students at Sudanese medical schools. (Elmadhoun & Elsanousi, 2014) King Saud University examined the effect of student gender on the academic performance, showed that the female medical students superior in the preclinical years. (Al-Mously, Salem, & Al-Hamdan, 2013) Similar findings found in agricultural field. (Faisal, Shinwari, & Hussain, 2017). A recent study from Saudi Arabia established higher academic performance among female and married students. (Salem et al., 2013)

Top grades in Sudan School Certificate Examination (SSCE) is the major selection criterion for medical students in Sudan through public admission. (Elmadhoun & Elsanousi, 2014) Pre-admission grade point average (GPA) is the best predictor of academic performance in all the health professions; however, the relationship between pre-admission GPA and clinical performance is less clear. (Salvatori, 2001) Previous academic performance accounts for 23% of the variance in performance in undergraduate medical training and 6% of that in postgraduate competency so it is suitable tool for assessment but not perfect. (Ferguson et al., 2002)

Students who speak English as a second language (ESL) face major challenges in English-language universities, but limited known about the relationship between English-language

acculturation and academic performance.(Salamonson, Everett, Koch, Andrew, & Davidson, 2008) Australian university discovered that unsatisfactory spoken language fluency associated with poorer performance.(Chur-Hansen, Vernon-Roberts, & Clark, 1997).

Once the students enrolled to the medical colleges, their performance varies. Few reported data are presently available concerning the effect of preadmission criteria, socio-demographic factor, English language proficiency, social and economic status. The aim of the study is to develop factors that lead to high academic achievement.

### **Method:**

A cross-sectional comparative analytic study carried out at Faculty of Medicine–Gezira University 2017. Faculty of Medicine at Gezira university, established in 1975, and it is one of the first schools to develop a community-based medical program. Graduated leaders in all discipline all over the globe. The evaluation system is an aggregate evaluation expressed as Cumulative Grade Points Average (CGPA) varies between 2 - 4. The total number of credit hours in the school is 254. The total number of credit hours allocated for clinical sciences is 117 hours.

All Students with outstanding academic performance and those with low performance from the final year who agreed to take part with CGPA equals or over 3.5 considered as excellent academic performance while CGPA less than 2.5 considered as low academic performance. The total number of students in the clerkship were 525 students from semester (8), (10) almost equally. The number of students with CAGP less than 2.5 were 64 only Twelve of them accepted to take part in the study with response rate of 18.8% and 82 students with CGPA 3.5 or more almost 61 of them accept to engage in the study with 74.4% response rate. Sample calculated using online sample size calculator at National Statistic Service at <http://www.nss.gov.au/nss/home.nsf/pages/Sample+size+calculator>.

Male to female ratio among the total patch number represented equally in the sample size. Data collected through Self-administered Questionnaire which includes sex, age, CGPA, academic performance, social status, previous academic performance, admission to university, English proficiency, diseases or disability, economic status and family characteristics.

Data gathered, arranged, edited and coded into a coding sheet and tested utilizing Analytical Package for Social Science 20. T- test applied to detect out potential important differences between factors influencing students' performance. The degree of statistical significance is  $P < 0.05$ .

#### **Ethical approval:**

consent obtained from students to access their results. Permission taken from FMUG ethical committee and administration to access students' results.

#### **Conflict of interest:** No

**Results** The sum of students with low CGPA were sixty-four. Twelve of them accepted to take part. Eighty-two students with high CGPA sixty-one of them accept to take part. Female to female rate in the patch is (67.4%) and (32.6%) respectively. In the study, they are 72.6% and 27.4%. also, (33.3%) with low CGPA were male,  $P$ -value = 0.426 which illustrated in **table (1)** which reflect that marital status is not important statistically as  $P$ -value = 0.692. **Table (2)** showed that both General admission to the university, Sudanese 2ndry school certificate and Secondary school exam attempts are statistically important with  $P$ -value = 0.002, 0.000 and 0.034 respectively, and not significant for English proficiency  $P$ - value= 0.250. **Table (3)** showed that disease or disability in the students significantly affect his/her performance  $P$ -value=0.023, while Disease or Disability in the family, financial support and economic status were not significant  $P$ =0.529, 0.716 and 0.519 consecutively. **Table (4)** demonstrate that Family Size, where the student lives (with family or not), father and mother education have no effects on the performance as  $P$ =0.615, 0.282, 0.889, 0.185 and 0.590 respectively. **Table (5)** Presents that Father Profession and presence of a physician in the Family have a positive impact on student's performance as  $P$ -value = 0.002 and 0.036.

**Table (1): Correlation between sex, marital status and academic performance 2017**

Profile of participants	High GPA students N=61 (%)	Low GPA students N=12 (%)	Total N=73	P- value
Gender				
Male	16 (21.9%)	4 (5.5%)	20 (27.4%)	0.426
Female	45 (61.6%)	8 (11%)	53 (72.6%)	
Social status				
Single	58 (80.6%)	12 (16.7%)	70 (97.2%)	0.692
Married	2 (2.8%)	0 (0%)	2 (2.8%)	

**Table 2: Correlation between preadmission criteria and academic performance 2017**

Profile of participants	High GPA students N=61 (%)	Low GPA students N=12 (%)	Total N=73	P-value
Admission to the university				
General	56	6	62	0.002
Private	5	6	11	
2ndry school certificate				
Sudanese	58	9	67	0.000
Arabic	0	3	3	
Others	3	0	3	
Secondary school exam attempts				
One	47	6	33	0.034
Two	11	3	14	
Three or more	0	1	1	
English Proficiency				
Fluent	14	1	15	0.250
Good user	46	9	55	
Deficient	1	1	2	

**Table (3) Correlation between diseases, economic status and academic performance 2017**

Profile of participants	High GPA students N=61 (%)	Low GPA students N=12 (%)	Total N=73	P-value
Disease or Disability				
Yes	4 (5.6 %)	4(5.6%)	8(11.2%)	0.023
No	56 (69.4 %)	8(11.2%)	64(88.9%)	
Disease or Disability in family				
Yes	17(23.6%)	3(4.2%)	20(27.8%)	0.529
No	43(59.7%)	9(12.5%)	52(72.2%)	
Financial support				
Self	0 (0%)	0 (0%)	0(0%)	0.716
Parents	53 (72.6%)	10 (13.7)	63(86.3%)	
Husband	2 (2.7%)	0 (0%)	2(2.7%)	
Other relative	5 (6.8%)	2 (2.7%)	7(9.6%)	
Scholarship	1(1.3%)	0 (0%)	1(1.3%)	
Economic status				
Low	6	1	7	0.519
Moderate	50	9	59	
High	4	2	6	

**Table (4) Correlation family characteristics and academic performance of medical students at FMGU 2017**

Profile of participants	High GPA students N=61 (%)	Low GPA students N=12 (%)	Total N=73	P-value
Family Size				
Less than 5	4 (5.6%)	1(1.4%)	5(7%)	0.615
5 or more	55 (77.5%)	11(15.5%)	66(93%)	
Live with family?				
Yes	34 (46.6 %)	5(6.8)	39 (53.4)	0.282
No	27 (39.9)	7(9.6%)	34(4.7%)	
If no. where?				
University Hostel	17 (26.6%)	2 (3.1%)	19(30%)	0.889
In a group	4 (6.3%)	1 (1.6%)	5(7.8%)	
With relatives	4 (6.3%)	1 (1.6%)	5(7.8%)	
Private hostel	1 (1.6%)	0 (0%)	1(1.6%	
Inapplicable	27 (42.2	7 (10.9)	34 (53%)	
Father Education				



Illiterate	1	0	1	0.185
Primary	2	0	2	
Secondary	12	2	14	
Graduate	23	9	32	
Postgraduate	22	1	23	
Mother Education				
Illiterate	2	1	3	0.590
Primary	3	0	3	
Secondary	20	6	26	
Graduate	17	3	20	
Postgraduate	19	2	21	

**Table (5) Correlation between preadmission criteria and academic performance of medical students at FMGU 2017**

Profile of participants	High GPA students N=61 (%)	Low GPA students N=12 (%)	Total N=73	P-value
Father Profession				
Employee	49	6	55	0.002
Employer	2	2	4	
Laborer	9	1	10	
Others	2	0	2	
Inapplicable	0	2	2	
Mother Profession				
Housewife	24	8	32	0.189
Employee	35	4	39	
Employer	2	0	2	
Physician in Family				
Yes	25	1	26	0.036
No	35	10	45	

## Discussion

in our investigation there is no distinct link between gender and academic victory, however, in Iran they reached a great link between self-esteem and academic performance, which in praise of males than girls.(SarAbadaniTafreshi, 2006)

in our study, no relation between marital status and academic performance, this is like what concluded in Nigeria,(Amuda, Bulus, & Joseph, 2016) But in UAE they noticed married students achieve higher CGPA's, but they are older when age- adjusted.(Thomas, Raynor, & Al-Marzooqi, 2012)

Interestingly, our study reported that one attempt Sudanese certificate and general admission to university positively related to academic achievement, Groningen university got comparable results.(Schripsema, van Trigt, Borleffs, & Cohen-Schotanus, 2014)

In our study, public admission to university positively influences academic performance P value 0.002. Private admission of medical students at Nile Valley university showed considerable variation got between private and public acceptance to medical school. (Elmadhoun & Elsanousi, 2014)

This analysis established that competence in English language bears no impact on academic achievement, which against our theory and what Al Shawwa et al. concluded, academic performance undoubtedly influenced by an expert knowledge of English.(Al Shawwa et al., 2015)

Eight had a chronic medical disease (Bronchial asthma, Migraine, Insulin-dependent Diabetes mellitus and repaired congenital heart defect, ...), half of them had poor academic performance P value 0.023. these disorders' influence emotional, physical condition and social relations and incapacity to approach educational achievement, This conforms with separate studies at school.(Lum et al., 2017) Farther, Scientist discovered that diabetes, sickle cell anemia, and epilepsy negatively affect undergraduate performance.(Taras & Potts-Datema, 2005)

family size doesn't affect students' performance, which is against postulation. Our way of life may justify this, as we live in extended families. Increased siblings drive to the assumption that family size determines economic condition and student achievement recourses dilution.(Downey, 1995) In Nigeria, there is a clear relation between socio-economic situation and higher secondary school performance.(Abdu-Raheem, 2015)

laborers fathers seem positively influence academic performance, students understanding, attitude and responsibility may explain this, as they work hard to have a role to support their families, father's profession involves a lot with achievement P-value 0.002. to our knowledge there is no study focused on this issue.

presence of physicians in the family has an important influence on performance P value 0.036, physician experience, advice and module may explain this, which proved by Al Shawwa et al. (Al Shawwa et al., 2015).

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