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Full Length Research Article

Selection Criteria for entry into the Medical Programme of Nigerian Universities: The Efficacy of Combining School Certificate Results with JAMB Scores in Selection of Candidates into the Ogbomosho Medical School

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ABSTRACT
The study was designed to assess the effect of combining (by equal weighting) 'O level scores in Physics, Chemistry, Biology and Mathematics with the University Matriculation Examinations (UME) Scores on the performance indices of 100level CGPA, 200L Physiology scores and overall success in the Faculty based 200L comprehensive examinations. The study showed a good correlation between the combined scores and CGPA and Physiology scores. However, there was no significant difference in the degree of correlation of the combined scores and the 'O' Level only scores with the 100L CGPA and 200L physiology scores. The UME only scores showed poor correlation with both the CGPA and 200L physiology scores.
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Key Words:
School Cert scores, Combined JAMB School Cert scores , CGPA, Adjusted UME scores

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INTRODUCTION

In an earlier study (Afolabi *et al* 2006) we demonstrated that selection procedures have an impact on the subsequent performance of medical students in the first two years of medical school. The problem of under performance in medical school by students admitted through the Joint Admissions and Matriculation Board (JAMB) has been reported in various studies (Oyebola 2000, Bamigboye *et al* 2001, Salahdeen & Murtala 2005, Oyebola 2006).Similar studies involving the larger University community of students (Kale 2004) have also shown that the University Matriculation Examinations (UME) scores taken at face value are highly unreliable predictors of future academic performance. All these studies including another of our recent studies (Afolabi *et al* 2007), showed that the 'O' Level scores of the students showed better correlation with the CGPA and Physiology scores. All the studies recommended that the 'O' level scores of candidates seeking admission should be a determining factor in granting them admission. The selection process into Nigerian universities is by and large based solely on the quality of the UME score (Oyebola 2006, Afolabi 2007). The strength or quality of the school cert result is largely ignored with the standard requirement being at least credit level passes in at least five subjects. Since the result can range for the excellent A1 to the just average or lucky mediocre C6, a vital predictive factor is being ignored (Oyebola 2006, Lipton *et al*1998, Monague and Odds 1998).

However, we are only aware of one university, The University of Ibadan (admission procedures U.I) which gives consideration to the quality of the school cert results. The University of Ibadan admission is heavily weighted towards the quality of the school cert results with the 'O' level results allocated 60% while the JAMB score is allotted 40%. In a recent study by Oyebola (2006), the 'O' level results and the JAMB scores were given equal weighting – 50% each. In that study, a retrospective application of these criteria on four candidates who were admitted solely on the strength of their JAMB scores showed that the overall results of two of them were poor, while the results of the students admitted with combination of O level and UME results were by and large excellent. However, a major drawback of the study as stated by the author was the small sample size of the JAMB only group (just four candidates). We therefore decided to embark on this retrospective study in order to test the efficacy of this selection method (combination of O level and UME scores), in selecting academically sound candidates. It is hoped that the selection procedure if proved to be efficient will form a viable alternative to post JAMB tests thereby rendering them unnecessary.

MATERIALS AND METHODS

The files of two hundred and ninety four students admitted through JAMB in 1998/99 (n = 121), 1999/2000 (n = 127), and 2000/2001 (n = 25) sessions, were used. The following data were extracted from the files, age, sex, O level grades in physics Chemistry Biology and Mathematics the UME/JAMB Scores, the CGPA at the end of 100 level and the 200 level physiology scores and pass or fail in the 200l comprehensive examination. The UME score was adjusted/reduced to 50 by dividing by a factor of 8. The O level grades in the four subjects were scored as earlier described by Oyebola (2006) as follows: A1 =6, B2 = 5, B3 = 4, C4 = 3, C5 = 2, C6 = 1. This would give a maximum score of 24 (4A1s) and a minimum of 4 (4C6s). This total score is then multiplied by two to bring it close to 50. Therefore for the school cert score (SCS) a maximum score of 48 (24 x 2) and a minimum score of 8 (4 x 2) is possible. The derived school cert score thus obtained is then summed up with the adjusted UME (UMEad) score to obtain the combined JAMB and school cert score (CJSC). The Cohort of students was then divided into three groups. Group I which consists of students whose CJSC was equal to or more than 60 (CJSC > 60), group II students who had CJSC less than 60 (CJSC <60) and group III which consisted of all the students (JAMB only). The summary indices of the three groups were calculated and compared using the student's t- test. The level of significance was taken to be a value less than0.05. A scatter diagram was drawn to

demonstrate the correlation or non-correlation of O level scores, adjusted UME scores CJSC scores 100L CGPA and physiology scores. Pearson's correlation coefficient was calculated for the cohort of JAMB admitted students in each of the three sessions to determine the degree of correlation between the preadmission academic characteristics (O level scores UME scores and CJSC scores) and the performance indices 100L CGPA and physiology scores.

RESULTS

Table 1 shows a comparison of the academic characteristics of students who had CJSC greater than 60 with that of students whose CJSC was less than 60. The students who had CJSC greater than 60 were significantly younger (P = 0.0175), had a better school cert score (P = 2.146 x 10-48). Their adjusted UME score,100 level CGPA and the 200 L physiology scores were also significantly better (P=0.0093, P = 9.39 x 10-10 and P = 1.75 x 10-6 respectively), than that of their counter parts who has CJSC less than 60. Pass-fail ratio was 5:1 for the students who had CJSC>60 it was approximately 1:1 in students whose CJSC was <60. The male/female ratio shows a preponderance of male students among the students whose CJSC score was>60 (67/23), while amongst the students who had CJSC<60 there was almost an equal number of male and female students (104/100).

Table 2 shows a comparison of the summary indices of the academic characteristics of students with CJSC greater than 60 with those of students based solely on basis of their JAMB scores. The JAMB only students were significantly older (P=0.01004), had significantly poorer school cert scores (P=2.95 x 10^{-43}), adjusted UME (P=0.0326), CJSC (P=3.47 x 10^{-45}), CGPA (P=8.81 x 10^{-6}), and Physiology scores (P=4.49 x 10^{-4}), than their counterparts who had CJSC greater than 60.

Table 1:
A comparison of Summary indices of the academic characteristics of students with CJSC greater than 60 with those of students whose CJSC was less than 60

	Combined Score(CJSC) n=294		
	CJSC <60 n = 204	CJSC> 60 n = 90	P value
Age	19.67±2.67	18.98±1.63	0.0033215
SCS	22.20±7.04	37.80±3.79	2.74 x 10^{-72}
UMEad	26.94±2.20	27.59±1.79	0.0040333
CJSC	49.01±7.28	65.39±3.68	3.11 x 10^{-76}
CGPA	3.32±0.51	3.73±0.49	1.15 x 10^{-9}
Physiology	50.26±7.18	54.85±7.04	2.39 x 10^{-6}
Pass/Fail Ratio	110/94	75/15	a^2 =23.156 HS
Male/Female	104/100	67/23	a^2 =14.129 HS

Table 2:
A Comparison of Summary indices of academic characteristics of students with CJSC greater than 60 with those of students admitted solely on the basis of their JAMB Score (JAMB only)

	JAMB ONLY n=294	CJSC> 60 n = 90	P value
Age	19.45±2.42	18.98±1.63	0.01004
SCS	26.97±9.52	37.80±3.79	2.95 x 10^{-43}
UMEad	27.13±2.09	27.59±1.79	0.0326
CJSC	54.02±9.91	65.39±3.68	3.47 x 10^{-45}
CGPA	3.44±0.54	3.73±0.49	8.81 x 10^{-6}
Physiology	51.75±7.45	54.85±7.04	4.49 x 10^{-4}
Pass/Fail Ratio	185/109	75/15	a^2 = HS
Male/Female	171/123	67/23	a^2 = HS

Table 3:
Correlation matrix of school cert score (SCS), adjusted UME (UMEad) score, CJSC score, 100 level CGPA and 200 level physiology score of 1998/99 JAMB admitted students.

	SCS	UMEad	CJSC	CGPA	Physiology
SCS	-	0.01595547	0.955287138	0.377852519	0.224826233
UMEad		-	0.238068527	0.127127424	0.026504859
CJSC			-	0.376505276	0.211258006
CGPA				-	0.424793358
Physiology					-

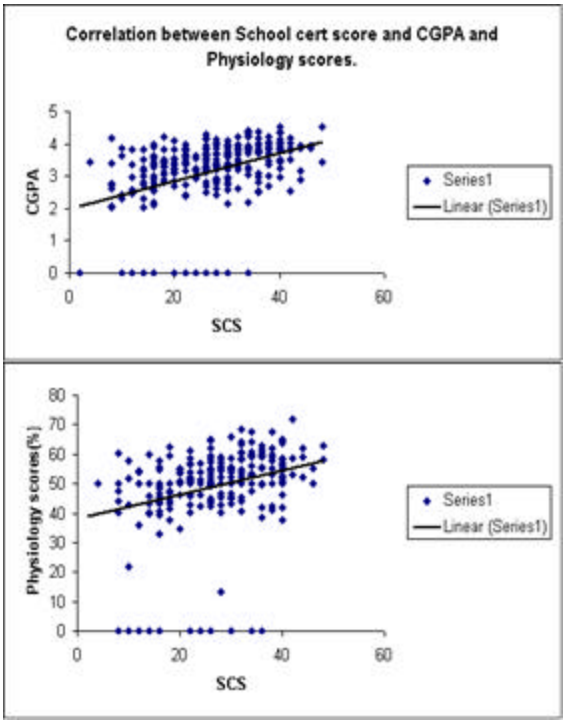

Figure 1
Scatter diagram showing the correlation of school cert score with 100 level CGPA and 200 Level Physiology score in all 294 JAMB admitted students from 1998/99, 1990/2000 and 2000/2001 sessions.

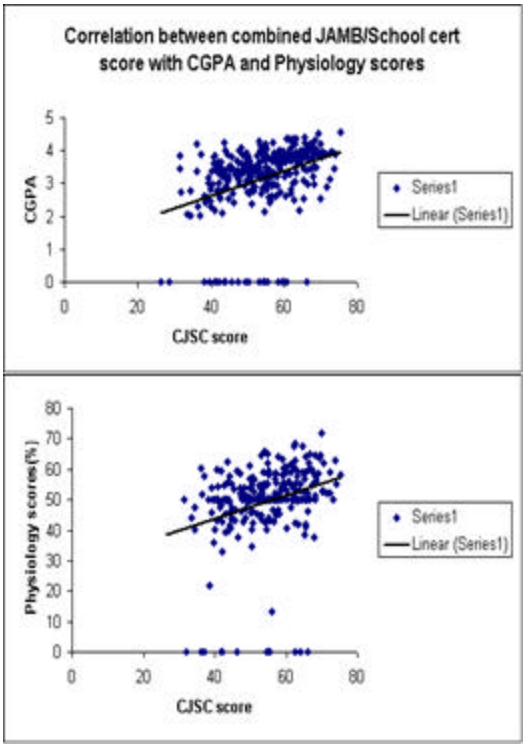

Figure 2
Scatter diagram showing correlation of combined JAMB school cert results (CJSC) with 100 Level CGPA and 200 level physiology among all 294 JAMB admitted

Table 4:
Correlation matrix of school cert score(SCS), adjusted UME (UMEad) score, CJSC score, 100 level CGPA and 200 level physiology score of 1999/2000 JAMB admitted students.

	SCS	UNME ad	CJSC	CGPA	Physiology
SCS	-	0.003081134	0.982988545	0.42751699	0.423232876
UMEad		-	0.186681975	0.26128769	0.1405777283
CJSC			-	0.421320667	0.438428217
CGPA				-	0.543486099
Physiology					-

Table 5:
Correlation matrix of school cert score(SCS), adjusted UME (UMEad) score, CJSC score,100 level CGPA and 200 level Physiology Scores of students admitted through JAMB in 2000/2001 session.

n = 27	SCS	UMEad	CJSC	CGPA	Physiology
SCS	-	0.203508798	0.973132394	0.442248078	0.319068257
UMEad		-	0.422502613	0.157954637	0.199821182
CJSC			-	0.446658272	0.337906158
CGPA				-	0.337920811
Physiology					-

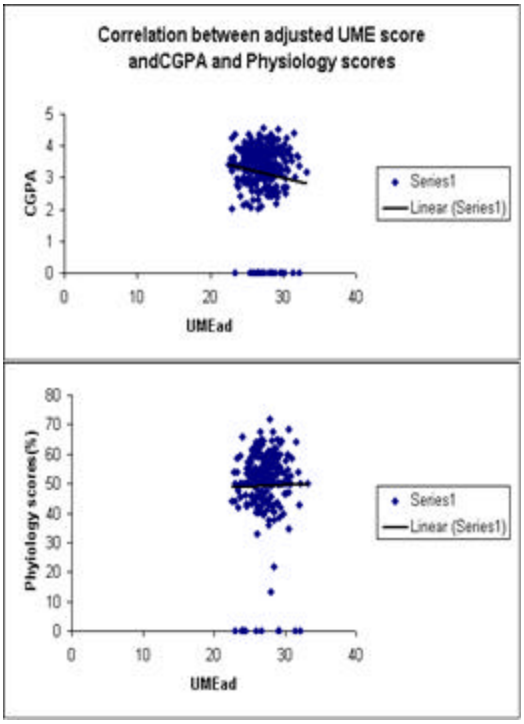

Figure 3
Scatter diagram showing correlation of adjusted UME score (UME ad) with CGPA and 200 level Physiology scores.

Tables 3, 4 & 5 show the correlation matrices of the calculated school cert score, adjusted UME score, the combined JAMB and school cert score, the 100 level CGPA and 200L Physiology scores of students admitted in 1998/99, 1999/2000 and 2000/2001 sessions. For all the students admitted in the three sessions there was significantly high correlation between the school cert score and the 100 level CGPA and 200L Physiology scores. There was also a significantly high correlation of the CJSC with 100 level CGPA and 200 level Physiology scores. However, there was poor correlation of the adjusted UME scores with 100 level CGPA and 200 Level physiology scores. The school cert score also showed little or no correlation with the adjusted UME scores of the sets of students admitted in 1998/99 and 1999/2000 (r = 0.01595547 and 0.003081134 respectively) sessions. However, the school cert score of the 2000/2001 set of students correlated fairly well with their adjusted UME (r = 0.203508788).

Figures 1, 2 and 3 are scatter diagrams showing the correlation of SCS, CJSC and adjusted UME with CGPA and Physiology scores respectively in all 294 JAMB admitted students spanning the three sessions under review.

While there was high degree of correlation between SCS and CJCS with both the 100 level CGPA and 200 level Physiology scores, the adjusted UME scores (UME ad) showed no correlation with both the 100 level (CGPA and 200 level physiology scores.

DISCUSSION

This present study was conceived as a follow up to an earlier study by Oyebola (2006). In the study Oyebola proposed a novel method of selecting medical students based on a combination of their school certificate scores and the JAMB/UME scores. Although he found that the thirty-one students admitted by this method performed excellently well, the students admitted by virtue of their JAMB/UME scores only without reference to their school cert results but had

relatively poorer performance constituted a very small sample size (4 students), thereby rendering the findings statistically suspect. In this present study the selection method of Oyebola was retrospectively applied to a cohort of 294 students previously admitted on the basis of their JAMB/UME scores only. The results shown in tables I and II demonstrate the efficacy of the selection method. The students who had combined JAMB and school cert (CJSC) scores greater than 60 had significantly better 100 level CGPA and 200 level physiology scores. Moreover, the same groups of students were significantly younger and had significantly better school cert scores. These findings agree with those earlier reported by other investigators, which asserted that younger students performed better than older students in Medical School (Fiel *et al* 1998, Bamgboye 2000, Afolabi *et al* 2007).

The finding of a significantly better adjusted UME (P=0.0326) among the students who had CJSC>60 was somewhat unexpected given the well documented findings of other investigators which found no significant difference or even inverse relationships in the UME scores of successful and non successful students (Kale 2004, Oyebola 2006). This discrepancy may not be unconnected with the fact that the cohort of students under investigation were largely admitted with relatively low UME scores having failed to meet the high cut-off marks of other more popular universities. In an earlier study involving these groups of students their mean UME score was found to be around 221(Afolabi *et al* 2007) – much lower than the 252 recorded at the University of Ibadan (Bamgboye *et al* 2001) around the same time. The finding may indicate that unlike the situation in other universities, the UME scores of these students are true reflections of their academic prowess. Another significant finding is the preponderance of males among the students who had CJSC>60 (67/23). This finding, though at variance with current trends in the developed countries of the world, where female students are generally better than their male counterparts (Calkins *et al*1987, Ferriman 2002, Ferguson *et al* 2002, Dosani 2003), is in agreement with the findings in other studies done in this area of the world. In these studies the male students were found to be more successful than the females (Olaleye and Salami 1997, Bamgboye *et al* 2001, Afolabi *et al* 2007).

In one of our resent studies on the academic profile of students failing in the first two years of medical school, we found that female students had a higher failure rate than the male students (Afolabi *et al* 2007).In an earlier study we put forward the different sociocultural factors affecting female students as a likely reason for the observed differences in their performance when compared with that of their counterparts from the developed countries (Afolabi *et al* 2007).

Several other studies also show that the quality of the 'O' level results correlate well with future performance in medical school (Oyebola 2000, Bangboye *et al* 2001, Afolabi *et al* 2007). The pass failure ratio of the CJSC >60 group was 75:15 while that of CJSC < 60 was 108:92 and the overall pass/fail ratio for the whole cohort of students before application of the selection method was 178:106. This high rate of success recorded by students who had combined (CJSC) scores of 60 and above confirms the efficacy of the method in selecting students most likely to succeed in the first two years of medical school.

When the students were separated according to year of entry, the finding of non correlation of the JAMB scores with performance at 100 level CGPA and 200 level physiology scores was consistent in all three intakes. By contrast both the school cert score and the combined JAMB and school cert score (CJSC) showed consistently good correlation with the 100 level CGPA and 200 L physiology scores. These findings further confirm our findings (Afolabi *et al* 2007,) and those of other investigators (Salahdeen & Murtala 2005, Bamigboye *et al* 2001, Oyebola 2006). It would appear that our study confirms the efficacy of combining JAMB scores with school cert results in selecting students likely to succeed in medical school. However, as Oyebola sounded a note of caution in the application of this method with regards to a likely increase in the incidence of falsification of O level results, we also want to note that this method may put students from rural schools who though otherwise brilliant, are

handicapped by attending poorly staffed and under equipped schools at a disadvantage. These students may come out with average O level results which do not reflect their true abilities. Conversely, it has been observed that some students with excellent school cert results, under perform on getting into medical school. This may be due to excessive "spoon feeding" by the excellent staff and equipment available at government funded and fee paying schools.

In conclusion we recommend that similar retrospective studies be carried out in institutions, which admit students primarily based on their UME/JAMB scores. Such studies will go a long way in supporting or rejecting the findings of this study. If the efficacy of the method is confirmed it can form a viable alternative to post JAMB tests which are currently generating a lot of controversy all over Nigeria (Afolabi *et al* 2007).

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