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Research article

Effect of Using Combination of O'level Result With JAMB Score on Student Performance in The First Two Years of Medical School in Benue State University, Makurdi,

***Adeniyi O.S, Araoye M.A, Amali E. O, Eru E.U, Ojabo C. O, and Alao O.O**

College of Health Sciences, Benue State University, Makurdi, Nigeria,

ABSTRACT: This study was carried out to assess the performance of students in the first two years of Medical School in Benue State University, a newly established College of Health Sciences. The assessment was based on some of their scores on admission into the University. These were the University Matriculation Examination (UME) scores, O'level (SSCE) score and combination by equal weighting of O'level scores with UME (CJSC) scores. The period of study involved the 100 and 200 level years respectively. Result showed that there was no correlation between UME score only and 100 level average score ($r = -0.054$, $P > 0.05$); but it correlates with 200 level results ($r = 0.318$, $P < 0.01$). There was correlation between SSCE and 100 level result ($r = 0.406$, $P < 0.001$) but not with 200 level average ($r = 0.176$, $P > 0.05$). CJSC correlates with 100 level weighted average ($r = 0.368$, $P < 0.001$) and 200 level result ($r = 0.240$, $P < 0.05$). Based on UME score only, 21.10% of students with UME score ≥ 240 as compared with 15.40% of those with UME score < 240 failed and were withdrawn at 100 level ($z = 0.695$, $P > 0.05$). The performance of students with high derived SSCE ≥ 60 was significantly better than those with lower SSCE < 60 ($P < 0.01$). Result also showed that SSCE is the best predictor of student performance at 100 level. It is suggested that the quality of Secondary School Certificate result should be given good consideration in admitting students into Medical Schools.

Keyword: UME score, SSCE, admission, University

INTRODUCTION

In many Nigerian Universities, the major criterion for admission is success in the University Matriculation Examination (UME) conducted by Joint Admission and Matriculation Board (JAMB). In fact a candidate with a very high UME score is very likely to gain admission into the University as long as he/she gets a minimum of credit six (C6) in the required basic O'level Secondary School Certificate Examination (SSCE). However many authors have reported that in Medical Schools, there is no correlation between academic performance

of students and UME score (Oyebola *et al*, 2000, Bamgboye *et al*, 2001, Salahdeen and Murtala 2005, Oyebola 2006). On the other hand studies have shown that the O'level result correlates better with academic performance of students at pre-clinical level (Oyebola 2006, Afolabi *et al*, 2007). These studies also recommended that the quality of the SSCE scores (or its equivalent) should be given high weighting during admission into the Medical School.

The criticism of the efficacy of using UME score as the major criterion for admission is that the level of examination malpractice is high (Umo 2003). This has led to a situation whereby those who are not qualified to gain admission find themselves in the Universities. In a study carried out by Kale (2004), it was reported that the best performance in all the Departments in the Faculty of Social Sciences in the University of Ibadan at the first year University Examinations were recorded by those students with JAMB scores of 221 to 240 or lower. In the same study, one student who came in with a JAMB score above 270, did not pass the minimum five courses needed to continue in the University and was therefore made to withdraw (Kale 2004). The

*Address for correspondence: supoadeniyi@yahoo.com
Phone: +234-805-198 0450

O'level SSCE examination, which is not totally free of examination malpractice, has proved to be a better predictor of performance at Pre-clinical levels than the JAMB scores.

The College of Health Sciences, Benue State University, a new Medical school, was established in 2004. Since then, students have been admitted yearly into the Medical Programme. The first two sets of students were admitted based on their performance in UME and Secondary School Certificate Examination; but since 2006, the College has adopted the Post-UME examination. Students who apply to read Medicine at the University and have scored a minimum of 200 UME qualify to take the Post UME test. Thereafter, successful candidates at the Post UME (score $\geq 50\%$) would have their UME considered and those with the best UME scores are selected to fill various categories of admission viz: National merit, State merit and the Local government areas of the State. No student with Post UME score less than 50% got admission to read Medicine.

The study was aimed at verifying the effectiveness of using the best UME score as the major criterion for admission. We attempted to determine the correlation between SSCE, UME, combination of both examination and academic performance of students in the first two years in the Medical school. For the first three sets of students admitted into Medicine, students with poor academic performance were withdrawn from the Medical school at 100 level. At 200 level, weak students repeat the class while the very poor students were withdrawn from the programme. It is hoped that with the result of this study, the University administration could be advised on the best way of selecting candidates for admission.

MATERIALS AND METHODS

The records of all students admitted to read Medicine in 2004/2005 and 2005/2006 sessions were used. They were 49 and 41 students respectively. Excluded from the study were 4 students who got admission through the University Remedial Programme and 3 others, admitted into 200 level through Direct. The latter categories of students do not require UME score for their admission. The following data were extracted from their files: Registration Number, Age, Sex, SSCE grades in English, Mathematics, Physics, Chemistry and Biology. The following variables were derived from these data:

- i. 100 Level Weighted Average (WA): This was obtained by dividing the sum of scores by the total credit units in the four subjects by 31.

Biology – 6 credit units

Chemistry – 8 credit units

Mathematics – 6 credit units

Physics – 11 credit units

For example, a student who scored 60% in Biology, 48% in Chemistry, 55% in Mathematics and 70% in Physics has a WA of $(60 \times 6 + 48 \times 8 + 55 \times 6 + 70 \times 11) \div 31 = 57.4\%$

- ii. 200 Level Average Scores in Anatomy, Biochemistry and Physiology – scaled down to 100%
- iii. SSCE(100): The SSCE grades in the 5 subjects (English, Mathematics, Physics, Chemistry and Biology) were calculated as a percentage by using a modification of the method of Oyebola (2006) as follows: A1 = 5 marks, B2 and B3 = 4, C4 = 3, C5 = 2, C6 = 1. Thus, a student who scored A1 in all the 5 subjects had a total score of $5 \times 5 = 25$, while another with C6 in 5 subjects had a total score of $5 \times 1 = 5$. In effect, the SSCE(100) ranged from 5 to 25. The total score was then multiplied by 4 to bring it up to 100 (%) in conformity with I and II above.
- iv. UMEad: This was obtained by scaling down the UME to 100 (by dividing the actual score by 4).
- v. CJSC: This was obtained by dividing the sum of UMEad + SSCE(100) by 2 to scale the sum down to 100.

Based on the above, 6 categories of students emerged:

Group I - UME ≥ 240

Group II - UME < 240

Group III - CJSC ≥ 60

Group IV - CJSC < 60

Group V - SSCE(100) ≥ 60

Group VI - SSCE (100) < 60 .

For their fate in the programme, they were divided into 5 categories viz:

A - Passed 100 level

B - Withdrawn at 100 level

C - Passed 200 level

D - Repeat 200 level

E - Withdrawn at 200 level.

The data were processed on a computer using SPSS 15.0 for Windows Evaluation Version for data entry and statistical analysis. Frequency distribution and descriptive statistics were used to summarise the data. The student t-test was used to test the difference between means and Pearson correlation coefficient was used to determine the correlations between SSCE, UME, 100 level weighted average, Physiology, Anatomy, Biochemistry and 200 level average. The Z

test was used to determine the significance of difference between two proportions and stepwise multiple regression analysis was used to determine the best predictor of performance at 100 level and 200 level. The level of significance was taken to be $P < 0.05$.

RESULTS

Table 1 shows the personal characteristics of the study group. A total of 90 students were involved. Their age range was 16 – 30 years with a mean of 19.72 ± 2.46 years. The sex ratio (male: female) was 4.2:1. The highest score in the UME was 277. The mean UME score was 237 ± 18.16 . All the students scored above 200 in their UME.

Table 1.

Personal Characteristics of Students

	Characteristics	No. of Student	% Distribution
Age Range	15 – 19	48	53.3
	20 – 24	40	44.4
	25 – 29	1	1.1
	30 – 35	1	1.1
Sex	Male	71	78.9
	Female	19	21.1
UME score	200 – 239	52	57.8
	≥ 240	38	42.2

Table 2:

Performance Based on UME score

	UME ≥ 240	UME < 240	P value
Age	20.29 ± 2.28 (n = 38)	19.31 ± 2.52 (n = 52)	> 0.05
SSCE (100)	57.58 ± 18.61 (n = 38)	55.85 ± 14.41 (n = 52)	> 0.05
UMEad	63.42 ± 2.56 (n = 38)	55.89 ± 2.47 (n = 52)	$< 0.01^*$
CJSC (100)	60.50 ± 9.41 (n = 38)	55.87 ± 7.50 (n = 52)	$< 0.05^*$
100 level average	58.34 ± 14.10 (n = 38)	60.00 ± 9.22 (n = 52)	> 0.05
Anatomy	53.93 ± 7.44 (n = 30)	51.57 ± 9.12 (n = 44)	> 0.05
Biochemistry	55.97 ± 7.36 (n = 30)	54.36 ± 9.06 (n = 44)	> 0.05
Physiology	52.03 ± 5.67 (n = 30)	50.93 ± 6.60 (n = 44)	> 0.05
200 level average	54.07 ± 6.36 (n = 30)	52.25 ± 7.93 (n = 44)	> 0.05

Data presented as mean \pm standard deviation (SD)

*= Significant difference

Table 2 shows a comparison of the academic performance of students admitted with UME score ≥ 240 with those whose score was < 240 . The result showed that the ages and SSCE(100) of the two groups were not significantly different ($P > 0.05$). The UMEad and CJSC results of students with UME ≥ 240 were significantly higher than those with UME < 240 ($P < 0.01$ and $P < 0.05$ respectively). The students with UME ≥ 240 had lower 100 level weighted average as compared with those having UME < 240 , but the difference is not significant ($P > 0.05$). There was no significant difference in the 200 level Anatomy, Biochemistry, Physiology and 200 level average between the two groups ($p > 0.05$).

Table 3:

Performance Based on CJSC score

	CJSC > 60	CJSC < 60	P value
Age	19.58 ± 2.30 (n = 36)	19.81 ± 2.58 (n = 54)	> 0.05
SSCE (100)	71.56 ± 8.65 (n = 36)	46.59 ± 11.81 (n = 54)	$< 0.01^*$
UMEad	60.64 ± 3.94 (n = 36)	58.02 ± 4.57 (n = 54)	$< 0.01^*$
CJSC (100)	66.10 ± 5.15 (n = 36)	52.31 ± 5.45 (n = 54)	$< 0.01^*$
100 level average	61.92 ± 12.33 (n = 36)	57.56 ± 10.66 (n = 54)	> 0.05
Anatomy	53.45 ± 8.07 (n = 33)	51.78 ± 8.88 (n = 41)	> 0.05
Biochemistry	55.97 ± 7.50 (n = 33)	54.24 ± 9.07 (n = 41)	> 0.05
Physiology	52.48 ± 5.71 (n = 33)	50.49 ± 6.55 (n = 41)	> 0.05
200 level average	54.00 ± 6.68 (n = 33)	52.17 ± 7.82 (n = 41)	> 0.05

Data presented as mean \pm standard deviation (SD)

*= Significant difference

Table 3 shows a comparison of the academic characteristics of students who had CJSC ≥ 60 with those whose CJSC was < 60 . There was no significant difference between their ages ($P > 0.05$). However students who had CJSC ≥ 60 had a significantly higher SSCE(100), and UMEad ($P < 0.01$ and 0.01) respectively. There was no significant difference in the 100 level weighted average, 200 Level Anatomy, Biochemistry, Physiology and overall 200 level average scores between the two groups ($p > 0.05$).

Table 4:
Performance Based on SSCE score

	SSCE ≥ 60	SSCE < 60	P value
Age	19.52 \pm 2.26 (n = 46)	19.93 \pm 2.66 (n = 44)	> 0.05
SSCE (100)	69.30 \pm 8.81 (n = 46)	43.27 \pm 10.50 (n = 44)	< 0.01*
UMEad	59.33 \pm 4.44 (n = 46)	58.80 \pm 4.59 (n = 44)	> 0.05
CJSC (100)	64.32 \pm 5.71 (n = 46)	51.03 \pm 5.22 (n = 44)	< 0.01*
100 level average	62.87 \pm 11.17 (n = 46)	57.57 \pm 10.72 (n = 44)	< 0.01*
Anatomy	51.70 \pm 6.90 (n = 43)	50.94 \pm 5.22 (n = 31)	> 0.05
Biochemistry	52.65 \pm 10.01 (n = 43)	52.35 \pm 5.96 (n = 31)	> 0.05
Physiology	55.37 \pm 9.34 (n = 43)	54.52 \pm 6.99 (n = 31)	> 0.05
200 level average	53.28 \pm 8.46 (n = 43)	52.58 \pm 5.52 (n = 31)	> 0.05

Data presented as mean \pm standard deviation (SD)

* = Significant difference

Table 4 shows a comparison of the academic performance of students based on their SSCE (100). The ages and UMEad of the two groups were not significantly different ($P > 0.05$). Students with SSCE (100) ≥ 60 have significantly higher CJSC and 100

level weighted average ($P < 0.01$ and 0.01 respectively). There is however no significant difference in the performance of these two groups at 200 level ($P > 0.05$).

There was no significant correlation between UMEad and 100 level weighted average ($p > 0.05$), but UME (100) correlated significantly with 200 level Physiology ($p < 0.05$), Biochemistry ($p < 0.05$) and Anatomy ($p < 0.01$) and year 2 average ($p < 0.01$). The CJSC correlated significantly with 100 level weighted average ($p < 0.01$) and 200 level average ($p < 0.05$). There was also significant correlation between SSCE (100) with year 1 weighted average ($p < 0.01$) but not with year 2 results (Table 5).

Based on UME score, higher proportion (84.60%) of students admitted with UME < 240 passed and were promoted to 200 level as compared with students admitted with UME ≥ 240 (78.90%). However, this difference was not significant ($p > 0.05$). Based on CJSC score 91.70% of students with CJSC ≥ 60 passed and were promoted to 200 level as compared with 75.90% of students with CJSC < 60 . This difference was not significant ($p > 0.05$). Based on SSCE (100) grade, a significantly higher proportion (93.50%) of students with SSCE (100) ≥ 60 passed and were promoted to 200 level as compared with 70.50% of student with SSCE < 60 ($p < 0.01$) as presented in Table 6.

Table 7 shows that at 200 Level, based on UME score, 93.30% of students with UME ≥ 240 passed and were promoted to 200 level while 88.60% of students with UME score < 240 passed and were promoted to 300 level. Based on CJSC 87.90% of students with CJSC ≥ 60 passed and were promoted to 300 level, while 92.70% of students with CJSC below 60 passed and were promoted to 300 level (Table 7).

Table 5:
Correlation between SSCE, UMEad, CJSC and 100 level average, Anatomy, Biochemistry, Physiology scores and 200 level Average.

		SSCE	UMEad	CJSC	100 level average	Anat	Biochem	Physio	200 level average
	N	90	90	90	90	74	74	74	74
SSCE	Pearson's correlation (r)	1	.090	.966(**)	.406(**)	.164	.161	.166	.176
UMEad	Pearson's correlation (r)	.090	1	.345(**)	.054	.281(*)	.246(*)	.348(**)	.318(**)
CJSC	Pearson's correlation (r)	.966(**)	.345(**)	1	.368(**)	.220	.208	.239(*)	.240(*)

Table 6
Performance at 100 Level Examinations

	Total Number	Passed	Withdrawn
Based on UME Score			
≥240	38	30 (78.90%)	8 (21.10%)
<240	52	44 (88.60%)	8 (15.40%)
Total	90	74 (82.22%)	16 (17.78%)
Based on CJSC Score			
≥60	36	33 (91.70%)	3 (8.30%)
<60	54	41 (75.90%)	13 (24.10%)
Total	90	74 (82.61%)	16 (17.39%)
Based on SSCE (100) Score			
≥60	46	43 (93.50%)	3 (6.50%)
<60	44	31 (70.50%)*	13 (29.50%)*
Total	90	74 (82.22%)	16 (17.78%)

* $P < 0.01$ compared with SSCE (100) ≥ 60

Table 7:
Performance at 200 Level Examinations

	Total Number	Passed	Repeat	Withdrawn
Based on UME Score				
≥240	30	28 (93.30%)	1 (3.30%)	1 (3.30%)
<240	44	39 (88.60%)	3 (6.80%)	2 (4.50%)
Total	74	67 (90.54%)	4 (5.41%)	3 (4.05%)
Based on CJSC Score				
≥60	33	29 (87.90%)	3 (9.10%)	1 (3.00%)
<60	41	38 (92.70%)	1 (2.40%)	2 (4.90%)
Total	74	67 (90.54%)	4 (5.41%)	3 (4.05%)
Based on SSCE (100) Score				
≥60	43	38 (88.40%)	3 (7.00%)	2 (4.70%)
<60	31	29 (93.5%)	1 (3.20%)	1 (3.20%)
Total	74	67 (90.54%)	4 (5.41%)	3 (4.05%)

* $P < 0.01$ compared with SSCE (100) ≥ 60

Based on SSCE (100), 88.40% of students with score > 60 and 93.5% of students admitted with SSCE (100) score < 60 passed and were promoted to 300 level (Table VII). However all these differences are not significant ($P > 0.05$).

The result of stepwise multiple regression analysis showed that SSCE (100) is the best predictor of performance at 100 level ($R^2=0.165$, $p<0.001$), while at

200 level UME is the best predictor of performance ($R^2=0.101$, $P<0.01$)

DISCUSSION

Several studies carried out in Nigeria have reported that O'level School certificate examination SSCE correlates better with performance in Medical school than JAMB (Salahdeen and Murtala 2005, Oyebola 2006, Afolabiet

al, 2007), which is used as the major criterion for admission into Higher Institutions in the country. Oyebola (2006) proposed a method of combining the SSCE result and JAMB by equal weighting and reported that students admitted by this method performed excellently well, than students admitted using their UME score without reference to their SSCE result. Afolabiet *al* (2007) further carried out the study in another Medical School using the method of combining SSCE and UME score (CJSC) by equal weighting and found out that students with CJSC greater than 60 had significantly better 100 CGPA and 200 level Physiology score. The “UME only” showed poor correlation with both the 100 level CGPA and 200L Physiology scores. In this present study however, a modification of this method was used. In this method the SSCE, UME and CJSC were all calculated as percentages based on 100 rather than the derived 50 marks for SSCE and 50 marks for adjusted UME used by Oyebola (2006). The result showed that students admitted with $UME < 240$ had a higher 100 level weighted average than students with $UME \geq 240$, but the difference is not significant ($P > 0.05$). Also, a greater percentage of students with the higher UME score, that is $UME \geq 240$, failed and were withdrawn at 100 level (21.10%) as compared with students with $UME < 240$ (15.40%). This result is quite remarkable, because candidates with the lower score performed better than those with the higher UME scores. This is in consonance with reports that the best performance at the first year University examination was achieved by students with lower UME score (Kale 2004) and that UME score does not correlate with performance in the medical school (Oyebola *et al*, 2000, Bamgboye *et al*, 2001). This lack of correlation might be due to the high level of examination malpractice that is reported during UME examination (Umo 2006). As a result many weak candidates score falsely high marks in UME and are granted admission, which they could not sustain.

There is no significant difference between the performance of students with $CJSC \geq 60$ and $CJSC < 60$ at 100 and 200 level respectively. This is in contrast to the report of Oyebola (2006) and Afolabiet *al* (2007) who reported a significantly better performance by students with $CJSC \geq 60$ over students with $CJSC < 60$. However the scores of students with $CJSC \geq 60$ is better than those with $CJSC < 60$. Based on pass/failure rate, a higher percentage of students with $CJSC \geq 60$ passed and were promoted to 200 level and a lower percentage failed and were withdrawn as compared with those with $CJSC < 60$. This suggests that CJSC is a better predictor of performance at the first year of the Medical school as compared with UME. Moreover,

Pearson Correlation showed that CJSC correlates with 100 level weighted average and 200 level average.

This study also revealed that students with SSCE (100) ≥ 60 had a significantly better performance at 100 level as compared with those with SSCE (100) < 60 . Based on pass/failure rate at 100 level, students with SSCE (100) ≥ 60 had a significantly higher percentage of success and a significantly lower percentage of withdrawals at 100 level as compared with students with SSCE (100) < 60 . SSCE (100) correlates with 100 level result. This is in line with reports that O'level score correlates with performance in the Medical school (Oyebola *et al*, 2000, Bamgboye *et al*, 2001, Afolabiet *al*, 2007, Kale 2004).

The regression analysis showed that at 100 level, SSCE(100) is the best predictor of success in the Medical School but at 200 level, UME is the best predictor. However, the correlation of performance at 200 level with UME might be due to the fact that weak students, especially those with high UME scores had withdrawn at 100 level, leaving the class with better students.

This study has demonstrated the importance of the quality of SSCE grade on the performance of students in the Medical school. A careful look at Table II reveals that there is no significant difference between the SSCE grade of students admitted with $UME \geq 240$ and $UME < 240$. These might give a clue to the reason why students with high UME score failed to justify their scores. It is therefore advised that University administration should start considering the quality of O'level grades. This is already in practice by the University of Ibadan (Admission procedures U.I), which gives consideration to the quality of the SSCE results. The University of Ibadan admission is heavily weighted towards the quality of the SSCE by allocating 60% to SSCE while the JAMB score is allotted 40%.

A new era has dawned with the introduction of “Post-UME Test” as one of the modalities for ensuring the admission of worthy students. This should complement the SSCE. It is advised that Universities should make Post-UME more competitive and make it have a good weighting when considering admission.

CONCLUSION

JAMB still has important roles to play in students' admission. These include: the prevention of multiple admission by a decentralized admission policy, which deny others opportunity. JAMB establishes standard for minimum requirement to secure admission. It gives equal opportunities to all citizens of Nigeria (Federal Republic Of Nigeria, 1983). But since report has shown UME is not a good criterion for admission, it is advised that Universities should give greater priority to other

entry examinations such as SSCE, CJSC and Post-UME in addition to UME score.

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