AFRICAN JOURNAL OF MEDICINE
and medical sciences

VOLUME 21, NUMBER 1, OCTOBER 1992

EDITOR: B.O. ONADEKO
ASSISTANT EDITORS:
B.O. OSOTIMEHIN and A.O. UWAIFO

SPECTRUM BOOKS LIMITED
Ibadan • Owerri • Kaduna • Lagos

ISSN 1116–4077

Afr. J. Med. med. Sci (1992) 21, 41-45

Student's attitude and predictor of performance in anatomy

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Summary

A survey of the attitude and performance of 158 students, made up of 101 males and 57 females that undertook second year anatomy examination in Obafemi Awolowo University, Ile-Ife, Nigeria was conducted. The results showed that there was no significant difference in the performance of the male and female students ($P > 0.05$); that age, performance at the Joint Matriculation Examination (JME), grade point average (GPA) in first year in the University, and performance in practical anatomy dissection had significant positive correlation with performance at second year examination in anatomy (PA2) ($P < 0.05$). However, Chi-squared test showed that hours spent on private students, JME score, have no significant association with PA2 ($P > 0.05$), but GPA has significant association with PA2 ($P > 0.05$). This suggests that GPA in the first year in the University is a predictor of performance in year two anatomy.

Résumé

Nous avons organisé une étude quiporte sur l'attitude et la performance de 158 étudients - 101 garcons et 57 jeunes filles - en deuxiéme année d'anatomie a l'Université d'Obafemi Awolowo è Ile-Ife au Nigeria.

Les résultats ont démontré qu'il n'y avait pas de grande difference dans la performance des étudiante et des étudiantes, alors que la moyenne de l'etudiant en première année a l'Université, les notes otennues au concours d'admission (JME), l'age et al performance aux travaux pratiques d'anatomie se sont trouvés en correlation de trés grande portée avec la performance d l'étudiant à l'examen d'anatomie de la deuxiéme année.

Cependant, un tableau de statistique croisé a montré que le nombre d'heures d'etudes privées en cours d'anatemie et al performance au concours d'admission n'avaient rucun rapport majeur avec la performance a l'examen d'anatomie de la deuxième année alors que la moyenne avait un raport significatif avec cet examen.

Il s'ensuit que la moyenne de l'etudiant en prèmière annee de l'Universite est indicative de la performance en deuxième annee d'anatomié.

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Introduction

The subject of anatomy is generally perceived by first year medical students as being very difficult[1,2] or too voluminous for the time allotted to it. Anatomy as a medical subject is taught to medical students in Obafemi Awolowo University, Ile-Ife, Nigeria during their second and third years. The students are usually admitted to the University on the basis of their performance in a national examination conducted by the Joint Admissions and Matriculation Board (JAMB). Admission to the University to study medicine is dependent on excellent performance in the examination. The admitted students spend one year studying general university based courses which include Zoology, Chemistry, Physics and Botany. If the student's grade point average (GPA), at the end of this first year, is not below 1.00, he is allowed to proceed to the second year to begin the medical curriculum starting with anatomy. A student is not allowed to proceed to the third year unless he scores 50% in the second year anatomy examination. The examination is internally conducted at the end of the second year. Those who fail are either asked to repeat the class or to withdraw from the program depending on their performance. Withdrawal of students from the medical course as a result of their poor performance inflicts a lot of psychological trauma on the students and their parents and presents a lot of concern to their teachers. If predictors of likely performance could be found, it would be useful in counselling students about continuing with the medical courses.

The difficulty encountered by the medical students in anatomy in their preclinical years has been addressed by several authors. Some[5,6,7,8] felt that the difficulties could be solved by the provision of teaching aids. Others[9,10] have suggested a clinical approach to the teaching of anatomy in order to provide motivation for the medical students by demonstrating the clinical

relevance of microscopic anatomy. Bharioke and Gupta[11] suggested the use of projection slides instead of the traditional chalk and board method while Prentice, Metcalf, Sharp and Hard[12] opined that anatomy teachers should receive qualitative training in the anatomy-based curriculum in order to appreciate the needs of the students. Poor performance by the students has also been associated with stress[4], and with poor visual memory[13]. Though investigations have been extensive in proferring solutions to the problems, most of the approaches have concentrated on the provision and improvement of teaching facilities. Very little attention seemed to have been paid to assessing the extent the individual student's attitudes have contributed to his problems in anatomy.

This paper addresses itself to two issues (i) the extent to which the Joint Matriculation Examination (JME) score and/or GPA in the first year in the University, can predict performance in second year anatomy; (ii) the extent to which attitude of the student affects his performance in anatomy.

Materials and methods

A total of 158 students comprising 101 males and 57 females, making up two sets of second year medical students of Obafemi Awolowo University, Ile-Ife, Nigeria were interviewed for the study. Their ages ranged from 17 to 28 years. The students were appealed to, to turn up for the interview irrespective of their sex, age, whether or not they were repeating the class. This freedom in the choice of respondents was necessary to avoid bias in the study. The students were also informed that their response to the questionnaire would contribute to solving problems encountered by students in anatomy.

Design of the interview

The students willfully volunteered information on their personal attitudes to anatomy, and on their previous performances in anatomy examination, JME, and their year one GPA. The quantitative information on age and examination scores were cross-checked with the students' records in their personal files in the Department of Anatomy, and in the office of the Dean of Faculty of Health Sciences of the University. The personal interviews conducted by the author were done in relaxed friendly atmosphere and during each student's free time. Each student answered the questions contained in the questionnaire. The questions were tested for validity and reliability. In testing for validity, the questionnaire was checked by colleagues in Anatomy and Psychiatry departments, noting relevance and adequacy of the questions. The questionnaire was further cross-checked by teachers in Psychology and Education departments. The final questionnaire was a consensus of opinions of the teachers.

In checking for reliability, the questionnaire was administered to 60 part II Students who did not eventually take part in the study. The split-half method was adopted and using the Pearson's Product Moment Correlation Coefficient Method, the reliability score of 0.85 was obtained, and this was regarded as satisfactory:

The questions were:

1. Were you under initial prejudice about anatomy before you started the course (IP)?
2. How many hours in a week beginning from Monday to Sunday inclusive did you use for your normal private studies in anatomy (PRH)?
3. Were you personally dissecting (active) during dissection (AD)?
4. Did you read up the area of the body to be dissected ahead of the dissection (RBD)?
5. Did you read up the lecture topic ahead of the lecture (RBL)?
6. Assess the usefulness of audiovisual aids to your performance.

The students were allowed to answer yes or no as the case was and were further asked to explain their response. The students were divided into four groups for the GPA analysis namely group 1 (GPA 1.01 - 2.00), group 2 (GPA 2.01 - 3.00) group 3 (GPA 3.01 -4.00), group 4 (GPA 4.01 - 5.00).

Data analysis

2-tailed student's *t*-test was used to verify whether there was any significant difference in the performance of the male and female students in anatomy. Pearson's Product-Moment Correlation Coefficient was used to indicate the relationship between performance in year two anatomy (PA2) as dependent variable and age, sex, GPA, JME & PRH as independent variables. The Chi-square test was used to verify the level of significance in the association of (PA2) with PRH, JME, and GPA. The percentage distribution of performance in relation to the attitude of the students was also calculated. The level of significance used was $P < 0.05$.

Results

The mean age of the students was 20.8 years, mean GPA was 2.70, mean JME score was 254.6 per cent, and mean PRH was 16.20 hours, (Table 1). A 2-tailed *t*-test of the performance of the male and female students in second year anatomy showed no significant difference between the two. Pearson's Product-Moment correlation showed low but significant positive correlation between PA2 and JME ($r = 0.33$, $P < 0.05$), high and significant positive correlation between PA2 and GPA ($r = 0.70$ $P < 0.05$), PA2 and age ($r = 0.59$, $P < 0.05$) (Table 2). The correlation between PA2 and PRH was not significant. The Chi-square test showed a significant association between PA2 and GPA ($P < 0.05$) (Table 3) and non-significant association between GPA and JME.

A large percentage of the students whose response was positive to RBL, RBD and AD questions passed the second year anatomy examination, whilst a large percentage of those whose response was negative failed the second year anatomy examination (Table 4).

Table 1 Range, mean and standard deviation (S.D.) of the age and performance of the students ($n = 158$)

	Range	Mean	S.D.
Age (years)	17.00-28.00	20.80	2.80
GPA	1.03- 4.57	2.70	0.89
JME (%)	220.00-306.00	254.60	19.41
PRH (hours)	7.00-43.00	16.20	8.07

GPA = grade point average in first year in the University
JME = score in Joint Admissions and Matriculation Examination
PRH = Total private reading hours in a week in anatomy.

Table 2 Pearson's Product-Moment Correlation Coefficients between PA2, Age, JME, GPA and PRH.

	PA2	Age	GPA	JME	PRH
PA2	1.00				
Age	0.69*	1.00			
GPA	0.71*	0.69	1.00		
JME	0.33*	0.67	0.87	1.00	
PRH	0.15	0.28	0.07	0.35	1.00

* = significant, $P < 0.05$.
PA2 = Performance in second year Anatomy Examination.
GPA = Grade point average in first year in the University.
JME = Scores in Joint Admissions and Matriculation Examination.
PRH = Total private reading hours in Anatomy in a week.

Table 3 Cross-tabulation of performance of medical students in second year anatomy (PA2) with their GPA in year one in the University

	Group 1	Group 2	Group 3	Group 4
GPA	1.01-2.00	2.01-3.00	3.01-4.00	4.01-5.00
No.Passed (%)	32 (53.3)	14 (33.3)	22 (57.9)	19 (88.9)
No.Failed (%)	18 (46.7)	28 (66.7)	16 (42.1)	2 (11.1)

Chi-Square = 11.41, *d.f.* = 3, ($P < 0.05$).

Table 4 Percentage distribution of the performance of the year two students in anatomy

Item (Response)	No. of Students	Passed (%)
IP (+)	100	52%
(-)	58	80
RBL (+)	40	75
(-)	118	49
RBD (+)	60	87
(-)	80	25
AD (+)	40	78
(-)	118	46

IP = Did you develop initial prejudice about anatomy?
RBL = Did you read up lecture topic ahead of the lecture?
RBD = Did you read up dissection topic ahead of the dissection?
AD = Were you personally dissecting during dissection practicals.
(+) = Positive response (-) = Negative response.

Fifty-two per cent of the 100 students that developed initial prejudice to the study passed while 48 per cent failed. Sixty per cent of the 158 students surveyed did not think the provision of audiovisual aids was beneficial to their understanding of anatomy. In the course of the interview the students stated that the instructions from their teachers were clear and smooth.

Discussion

The significant (P <0.05) positive correlation observed between PA2 and JME, GPA, suggests that a student with a good JME score and a good GPA was likely to perform well in anatomy. But the real predictor of performance in anatomy is the GPA which was observed to have significant association with PA2 (from Chi-squared test P <0.05) (Table 2). Students who were repeating accounted for 77% of those that passed in group 1 (GPA: 1.01-2.00), 23% in group 2 (GPA: 2.01-3.00) and 5% in group 3 (GPA: 3.01-4.00). There was no repeating student in group 4 (GPA: 4.01-5.00). This shows that students who were repeating were more likely to have had lower GPA, and the lower the GPA the more the tendency to fail the examination at first attempt. That some students in every group failed suggests that there are other factors that contribute to performance in anatomy. Forty-eight percent of the students who developed initial prejudice failed the examination. This undescores the negative effect of lack of motivation in the study of anatomy as was earlier indicated by Prentice *et al* [12], Fitzgerald and Fitzgerald[8]. The large number of failure among students who did not prepare for lecture or dissection ahead of schedule, and who did not participate actively in dissection emphasises the importance that preparation for lecture and dissection have on the performance of the students. Active participation in dissection ensures that the student is intimately familiar with the subject. The lack of significant association between PA2 and hours spent in a week in private studies (PRH) suggests that the amount of time spent in reading anatomy is not necessarily parallel with performance in the subject. Age maintained significant correlation with PA2. This could be because the older students are better able to overcome the problems of initial prejudice and stress in the study of anatomy. The inability of students to appreciate the usefulness of audio-visual aids such as projection slides and films in their understanding of anatomy was indicated by the fact that 60% of the 158 students surveyed did not think the aids were helpful in their study of anatomy. It is possible that the students were taking the audio-visuals as another form of entertainment movie session. Jacobs and Alvarado[7], Bharioke and Gupta[11] noted that audiovisual aids enable students to become familiar with the subject of anatomy.

Conclusion

The study of the performance of students in second year anatomy indicates that GPA in year 1 in the University is a good predictor of the student's performance in year 2 anatomy. Students with lower GPA are most likely to fail second year

anatomy examination and should be advised to change to another discipline instead of continuing with the medical curriculum. Practical dissection affects the student's performance in anatomy. Those with less interest are most likely to fail the examination. The students should be made to appreciate that projection slides and films are useful motivators in their understanding of anatomy, complementing the use of practical dissection, and not to be considered as entertainment movie sessions.

Acknowledgement

The author thankfully acknowledges the useful criticisms offered by Professor R. O. A. Makanjuola of the Department of Psychiatry of Obafemi Awolowo University, Ile-Ife, Nigeria.

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(*Accepted* 21 *May* 1990)