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Assessment Methods in Medical Education and Their Performances Among Medical Students of Delta State University, Abraka, Nigeria

Dibie, Oluchi
Department of Human Anatomy and Cell Biology,
Faculty of Basic Medical Sciences,
Delta State University, Abraka, Nigeria
Corresponding author email: oluchidibie@gmail.com

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Abstract
Assessment of medical education is important to verify whether or not the objectives of training are being met. This study examined the assessment methods used in the medical education of medical students and their performances at Delta State University, Abraka, Nigeria. Participants were medical students of the University, aged between 17 and 32 years, and a sample of three hundred and three (303) subjects, comprising one hundred and forty-three (143) males and one hundred and sixty (160) females, was recruited using a multistage/cluster sampling technique. A two-page recruitment poster introducing the study's background, objective, procedures, and declarations of anonymity and confidentiality, together with the link and quick-response code of an online questionnaire, was circulated to medical students' groups on WhatsApp. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 23, with chi-square tests used to test the significance of differences between male and female respondents, and a p-value < 0.05 considered statistically significant. Most respondents were in their fourth year of study (46.2%), followed by the third year (31.0%) and second year (22.8%). Most of the respondents (49.5%) preferred the essay method of assessment, mainly because it examined the total knowledge of the individual (64.7%). The majority also agreed that multiple-choice questions (MCQs) were a very difficult assessment method to pass (75.6%), and that practical assessment was the method they understood least well. Correspondingly, respondents reported their highest performance in essay assessment (31.0% rated high) and their lowest performance in oral/viva voce assessment (83.2% rated low). The study concludes that the choice and perceived difficulty of an assessment method are closely linked to students' reported performance in it, and recommends that medical faculties give renewed attention to the design and administration of oral, practical and objective assessment formats.

Keywords: *Assessment methods; Medical education; Medical students; Student performance; Delta State University*

1.0 Introduction

Assessment is a fundamental component of both learning and teaching, as it frames what students learn and shapes their certification (Norcini, 2003). Broadly speaking, assessment refers to the processes employed to make judgments about the achievements of students over a course of study (Harlen, 2005). The use of a variety of assessment methods has been characteristic of medical education, credentialing and licensure since the 1950s. Prior to that

period, the medical knowledge and clinical skills of doctors were typically assessed through written and oral examinations: written examinations composed largely of open-ended questions graded by hand, and oral examinations (viva voce) that required the student to attend a patient's bedside, gather information, and then present a diagnosis and treatment plan to assessors who questioned and judged the performance.

Assessment of medical education is important to verify whether the objectives of training are being met. Medical education emphasises not only the art and science of teaching but also the acquisition of professional skills, and assessment is as crucial to the student as it is to the teacher, given its far-reaching implications for students, trainers, and the wider community (Maxim & Dielman, 1987; Sloan et al., 1993). A number of studies have been conducted around the globe on the assessment methods used in medical education, yet there remains a dearth of comparable data on medical students in Nigeria, which provides the motivation for the present study. The study therefore focused on the assessment methods used in the medical education of medical students at Delta State University, Abraka, and on their performances in these methods, with the following specific objectives: to determine the preferred assessment method among medical students at the University; to determine the reasons underlying students' choice of assessment methods; and to assess students' performances in their preferred assessment methods. The findings are intended to provide baseline data of relevance to the school community and to lecturers in the Faculty of Basic Medical Sciences, Delta State University, Abraka.

2.0 Literature Review

2.1 Conceptual Literature

Assessment has been described as a process that involves testing, measuring, collecting and combining information, and providing feedback (Norcini et al., 2011). It can also be defined as a sample taken from a larger domain of content and process skills that allows one to infer a student's understanding of a part of that larger domain (Epstein, 2007). Assessment in medical education is vital because of its far-reaching implications not only for students and their trainers but for the communities and world at large (Maxim & Dielman, 1987), since every medical school admits students with the aim of producing doctors competent to offer quality medical care to their communities. Two broad types of assessment are commonly distinguished. Formative assessment is carried out by a teacher to establish a learner's grasp of material at the end of a chapter or unit, and includes class tests, quizzes, assignments, viva, oral presentations, case studies and laboratory reports. Summative assessment, by contrast, is carried out at the end of a semester or academic year to evaluate a student's overall performance; it is also known as a term or cumulative examination, and is used to measure course outcomes and the extent to which instructional objectives have been achieved.

2.2 Empirical Literature Review

A number of empirical studies have examined specific assessment formats in medical and allied health education. Gargi et al. (2016) compared the performance of undergraduate medical students in traditional viva voce and objectively structured viva voce (OSVV) during a formative assessment in microbiology, and found that significantly more students passed in the traditional viva than in the OSVV, with the traditional format also receiving more favourable rankings overall. Abidullah et al. (2016) surveyed final-year medical students at Khyber Medical College, Peshawar, on their perceptions of the objective structured clinical examination (OSCE), finding that the large majority regarded the examination as fair, valid and reliable, even though most also found it more stressful than other formats.

Tejas et al. (2019) compared structured and unstructured forms of viva voce for the internal assessment of undergraduate pharmacology students, and reported that mean marks in the

structured viva correlated more closely with theory examination results than did marks in the unstructured viva, which were significantly higher but less consistent with theory performance. Rizwan et al. (2015) similarly found that fourth-year medical students were broadly satisfied with a structured viva format, citing the relevance of questions to the syllabus and a comfortable examination environment as particular strengths.

Nabiha et al. (2019) explored dental students' perceptions of various assessment formats at a Pakistani dental college and found that the OSCE was the most liked method, followed by structured essay questions, largely on grounds of convenience and consistency of marking; students also considered viva voce to be the format that most improved their confidence. James (2016), reviewing the literature on dental undergraduates' views of the OSCE, found that it was generally regarded as a valid assessment despite inducing higher anxiety than other formats, with most students indicating that they would choose a similar format again.

Sufia et al. (2019) developed and validated a structured oral viva voce examination in biochemistry for first-year dental students and found that structured viva scores were both higher and more consistent than scores obtained through traditional viva voce, a finding broadly echoed by Mrunal and Krishnakant (2013) in a study of structured oral examination in physiology, who additionally reported reduced student anxiety and more uniform questioning under the structured format. Adesh and Chaturvedi (2019) reported comparable gains in formative pharmacology assessment, alongside some practical challenges in structuring viva examinations, including rigid time limits and examiner fatigue.

Salman et al. (2018) examined the test anxiety triggered by different assessment modalities among medical students and found that long-case examinations and examiner-based OSCEs were associated with the highest anxiety scores, with excessive course load and insufficient syllabus coverage identified as contributing factors. Dash et al. (2013), surveying medical students on their perceptions of prevailing assessment practices, found that normal lectures and group discussion were considered the most effective methods of assessment, while blackboard-based and audio-visual assessment were also positively regarded.

Taken together, this body of literature indicates that undergraduate and dental medical students generally favour assessment methods that are structured, transparent in their marking criteria, and perceived as testing genuine understanding rather than guesswork, and that the perceived difficulty and fairness of a given method is closely related to how well students report performing in it.

3.0 Methodology

The study adopted a descriptive cross-sectional survey design. It was conducted at Delta State University, Abraka, Nigeria, among medical students of the University between the ages of 17 and 32 years. A sample of three hundred and three (303) subjects, comprising one hundred and forty-three (143) males and one hundred and sixty (160) females, was recruited using a multistage/cluster sampling technique.

Data were collected by means of a two-page recruitment poster, posted and reposted to medical students' groups on WhatsApp, which introduced the study's background, objective and procedures, and set out declarations of anonymity and confidentiality, together with the link and quick-response code of an online questionnaire. The questionnaire consisted of four parts: a demographic section (gender, age and level of study); a section on the assessment methods used among the medical students; a section on the reasons underlying their choice of response; and a section on self-reported performance. In total, the questionnaire comprised fifteen questions, six on assessment methods, six on reasons for choice of response, and three on performance, with performance scored as low, medium or high, and the remaining items scored on a four-point scale of strongly disagree, disagree, agree and strongly agree.

Inclusion criteria were male and female students of Delta State University, Abraka, aged between 17 and 32 years; students who declined to participate, or who fell outside this age range, were excluded. Ethical approval for the study was obtained from the Research and Ethics Committee of the Department of Human Anatomy and Cell Biology, Faculty of Basic Medical Sciences, Delta State University, Abraka. Data obtained were analysed using the Statistical Package for Social Sciences (SPSS) version 23 and presented as pie charts and frequency distributions; the chi-square test was used to test the significance of differences between male and female respondents, with a p-value of less than 0.05 considered statistically significant.

4.0 Results

Of the three hundred and three (303) subjects studied, one hundred and forty-three (143, 47.2%) were male and one hundred and sixty (160, 52.8%) were female. Respondents fell into the following age groups, in descending order of frequency: 21–24 years (57.8%), 17–20 years (26.7%), 25–28 years (12.2%), and 29–32 years (3.3%). Most respondents were in their fourth year of study (46.2%), followed by the third year (31.0%) and second year (22.8%) (Table 1).

Table 1: Sociodemographic Characteristics of Respondents

Variable	Frequency	Percentage (%)
Gender: Male	143	47.2
Gender: Female	160	52.8
Age 17–20 years	81	26.7
Age 21–24 years	175	57.8
Age 25–28 years	37	12.2
Age 29–32 years	10	3.3
Year of study: 200 Level	69	22.8
Year of study: 300 Level	94	31.0
Year of study: 400 Level	140	46.2

Source: Field survey, 2020.

Table 2 presents respondents' most preferred method of assessment, together with the reasons given for their choice. Overall, essay emerged as the most preferred method (49.5% of respondents), chiefly because it was seen to examine the total knowledge of the individual (64.7%). Among those evaluating multiple-choice questions (MCQs), the majority (75.6%) regarded the format as very difficult to pass. For practical assessment, the majority of respondents (58.4%) reported that they did not understand the exercise whenever it was carried out, while for the stipple chase (spot/practical identification) component, most respondents (68.3%) felt that insufficient time was allowed. Oral/viva voce was regarded by the majority of respondents (82.8%) as a very difficult method of assessment.

Table 2: Most Preferred Method of Assessment and Reasons for Choice

Assessment Method / Reason	Frequency	Percentage (%)
Essay — easier to comprehend	20	9.9
Essay — examines total knowledge	196	64.7
Essay — feasible	16	5.3
Essay — dislike essay	61	20.1
MCQs — very easy to pass	51	16.8
MCQs — very difficult to pass	229	75.6
MCQs — can guess answers without study	10	3.3
MCQs — dislike MCQs	13	4.3
Practical — understand course better	112	37.0
Practical — do not understand practicals	117	58.4
Practical — feel tired	9	3.0
Practical — should discontinue practicals	5	1.7
Objective questions — very easy to pass	114	37.6
Objective questions — very difficult to pass	172	56.8
Objective questions — can guess answers	12	4.0
Objective questions — dislike format	5	1.7
Oral/Viva — best method of assessment	29	9.6
Oral/Viva — very difficult method	251	82.8
Oral/Viva — feel tired easily	12	4.0
Oral/Viva — subjective	11	3.6
Stipple chase — appreciate anatomy better	69	22.8
Stipple chase — insufficient time given	207	68.3
Stipple chase — feel scared	16	5.3
Stipple chase — feel sick after cadaver exposure	11	3.6

Source: Field survey, 2020.

Table 3 presents respondents' self-reported performance across the assessment methods examined. The majority of respondents reported high performance in essay assessment (31.0%), whereas performance was reported as predominantly low in multiple-choice questions (67.0%), practical assessment (71.6%), oral/viva voce (83.2%) and the stipple chase (75.9%). Performance in objective questions was most commonly reported as medium (60.4%).

Table 3: Self-Reported Performance in Various Methods of Assessment

Assessment Method	Low (%)	Medium (%)	High (%)
Essay	48 (15.8)	161 (53.1)	94 (31.0)
MCQs	203 (67.0)	87 (28.7)	13 (4.3)
Practical	217 (71.6)	78 (25.7)	8 (2.6)
Objective Questions	110 (36.3)	183 (60.4)	10 (3.3)
Oral/Viva	252 (83.2)	39 (12.9)	12 (4.0)
Stipple Chase	230 (75.9)	73 (24.1)	0 (0.0)

Source: Field survey, 2020.

5.0 Discussion

The competent and fair assessment of a large number of medical students with minimum stress remains a difficult logistical task that confronts almost every medical educator, and no single assessment tool has yet commanded universal agreement among researchers in the field. Various assessment techniques and methodologies, including structured viva examination, continue to be refined in an effort to improve the reliability and validity of the assessment process. In the present study, the most preferred method of assessment among medical students was the essay format, chiefly because it was seen to examine the respondent's total knowledge. The most difficult method of assessment was perceived to be multiple-choice questions, while most respondents also reported that they did not understand practical assessments whenever these were carried out, and did not find oral/viva voce assessment favourable. This finding is consistent with that of Nabiha et al. (2019), who similarly identified the structured essay format as the method most preferred by the dental students they studied. It is, however, at variance with the finding of Shenwai and Patil (2013), who reported that students in their study favoured structured viva voce examination over the essay format.

Respondents in the present study were also largely dissatisfied with the manner in which the stipple chase (practical identification) component was conducted, and were of the view that more time should be allowed during this form of assessment; this specific finding does not appear to have been documented in the comparable literature reviewed above. Consistent with students' stated preferences, respondents reported their highest level of performance in essay assessment, and comparatively lower performance in multiple-choice questions, the stipple chase, oral/viva voce and practical assessment, a pattern that may plausibly be linked to the frequency with which students expressed dissatisfaction with these particular methods of assessment.

6.0 Conclusion and Recommendations

This study has shown that medical students at Delta State University, Abraka prefer the essay method of assessment, principally because it is seen to examine their full knowledge of a subject, and that their self-reported performance is correspondingly highest in this format and comparatively lower in multiple-choice, practical, oral/viva voce and stipple chase assessments. These findings provide baseline data on the assessment methods and performances of medical students at Delta State University, Abraka, and may assist the University's academic leadership in reviewing the design and administration of its assessment formats. It is recommended that further studies be conducted among students in other departments and faculties of the University, in order to establish more broadly the assessment methods most preferred by students and thereby inform curriculum planning. It is further recommended that medical faculties give particular attention to the design of oral/viva voce,

practical and objective-question formats, given the consistently low performance and high perceived difficulty associated with these methods in the present study, and that adequate time be allocated for practical and stipple-chase components of assessment.

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