



Educational Article

Determining the anatomy of anatomy educators

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Received 10 January 2020; revised 29 February 2020; accepted 1 March 2020; Available online 23 March 2020



المخلص

أهداف البحث: يعد النقص المتزايد في اختصاصي علم التشريح وعدم الاتساق في مؤهلاتهم التعليمية من الاهتمامات الرئيسية في التعليم الطبي على مستوى العالم. الغرض من هذه الدراسة هو تقييم ديناميكيات معلمي علم التشريح في نيجيريا فيما يتعلق بخصائصهم العامة ومؤهلاتهم وخبراتهم في التدريس وتركيزهم على البحث.

طرق البحث: أجريت هذه الدراسة بين المشاركين في المؤتمر السنوي السادس عشر للجمعية التشريحية لنيجيريا الذي عقد في جامعة كالابار، في نيجيريا في عام ٢٠١٩. تم جمع البيانات باستخدام استبانة ذاتية الإدارة وتحليلها باستخدام برنامج ميكروسوفت إكسل كتنكرار ونسب مئوية.

النتائج: من بين ٨٤ من أعضاء هيئة التدريس، شارك ٥٦ (٦٥.٤٪) في هذه الدراسة؛ وكان هناك ٦٨٪ من الرجال و٣٢٪ من النساء. ينتمي ٢٧ عضواً من أعضاء هيئة التدريس كحد أقصى إلى الفئة العمرية من ٣١ إلى ٤٠ عاماً، بينما ينتمي خمسة فقط إلى الفئة العمرية من ٥١ إلى ٦٠ عاماً. خمسة وعشرون (٤٥٪) منهم حاصل على درجة الدكتوراه في علم التشريح، وجميع غير الحاصلين على الدكتوراه (٩٧٪)، باستثناء واحد، يطمحون للحصول على درجة أعلى في علم التشريح. كان الاهتمام البحثي (٢٩؛ ٥٢٪) في علم التشريح العصبي وعلوم الأعصاب هو الأكثر شيوعاً. وعمل أكثر من نصف المشاركين (٣١؛ ٥٥٪) في الجامعات الفيدرالية، و١٦ (٢٩٪) في جامعات الولايات، وأربعة (٧٪) في الجامعات الخاصة، وخمسة فقط (٩٪) كانوا يعملون في المؤسسات المتحالفة معها.

الاستنتاجات: معظم المتخصصين في علم التشريح في نيجيريا هم في منتصف العمر وفي منتصف العمر الوظيفي. المؤهل الأكثر شيوعاً هو درجة الماجستير، وعدد قليل حاصل على درجة الدكتوراه. مع خبرة قليلة أو معدومة بعد الدكتوراه.

تركز البحث على بعض مجالات التشريح. كشفت هذه الدراسة عن حاجة ملحة لمعالجة الثغرات التدريبية والبحثية في علم التشريح.

الكلمات المفتاحية: معلمو علم التشريح؛ المعلمين الطبيين؛ تشريح التدريس؛ تشريح؛ بحوث التشريح

Abstract

Objective: The growing shortage of anatomy educators along with inconsistencies regarding their educational qualifications has become a major global concern for medical education. The purpose of this study is to assess the dynamics of anatomy educators in Nigeria with respect to their general characteristics, qualifications, teaching experience, and research focus.

Methods: This study was conducted on the participants of the 16th Annual Conference of the Anatomical Society of Nigeria held at the University of Calabar, Nigeria in 2019. The data were collected through a self-administered questionnaire and analysed as frequencies and percentages using Microsoft Excel.

Results: Out of 84 faculty members, 56 (72.4%) participated in this study; 68% of the participants were men and 32% were women. A maximum of 27 faculty members belonged to the '31–40 years old' age group while only 5 belonged to the '51–60 years old' group. Twenty-five (45%) faculty members had a Ph.D. in Anatomy and all the non-Ph.D. holders (97%), except for one, aspired for a higher degree in Anatomy. The research interest with the highest frequency (n = 29; 52%) was in neuro-anatomy and neurosciences. Over half of the respondents (n = 31; 55%) worked in federal universities, 16 (29%) in

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Peer review under responsibility of Taibah University.



state universities, 4 (7%) in private universities, and only 5 (9%) were employed in allied institutions.

Conclusion: Anatomy professionals in Nigeria are mostly middle-aged and mid-career individuals. Most of them have master's degrees while only a few hold PhDs and have little to no postdoctoral experience. The research focus was concentrated on some areas of anatomy. This study reveals the urgent need to address the training and research gaps in the field of anatomy.

Keywords: Anatomy; Anatomy educators; Anatomy research; Medical educators; Teaching anatomy

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Introduction

Anatomy is the study of the structure of the human body and a sound understanding of it is required of all healthcare personnel for efficient and effective medical intervention. Anatomists are the educators and professionals responsible for the teaching of anatomy to medical and allied health students. The subject is of much importance to these programmes, as attested by various authors.¹⁻⁴ The steady increase in the number of medical schools, enrolling students, and educational programmes that require anatomical knowledge has resulted in an inadequate supply of anatomy educators.⁵⁻⁷ The discipline of anatomy in Nigeria,⁸ as well as the rest of the world, faces several obstacles, including the shortage of anatomy educators and inconsistencies in the educational qualifications of those who teach anatomy.^{9,10} Consequently, an increasing number of people without core anatomy training are becoming anatomy educators.¹¹

Clinicians have been identified as a potential source of good anatomy educators.¹² However, studies conducted by different authors in Nigeria among preclinical medical students showed that only 1.5%¹³ to 6.2%¹⁴ of them were interested in anatomy as a career upon graduation from medical school. Aside from teaching, most anatomy educators also hold secondary roles as researchers in either experimental or clinical settings. As a result, adequate funding for the research they conduct could provide them with better scientific or therapeutic advancement while providing students with a better learning experience.¹⁵ Given that the profession is indispensable to the training of much-needed healthcare personnel, it is therefore essential that those engaged in the teaching process are adequate in both quality and quantity.

In line with this, the main aim of the study is to (1) assess the composition of anatomy educators in Nigeria, (2) establish their general characteristics, and (3) identify possible training gaps, if any. This will help improve the current

outlook of anatomy as a scientific discipline and will further assist in shaping the training needs of future anatomists.

Materials and Methods

This descriptive cross-sectional study was conducted on a sample of faculty members who were actively involved in teaching and research in anatomy. They also participated in the 16th Annual Scientific Conference and General Meeting of the Anatomical Society of Nigeria (ASN) held at the University of Calabar, Cross River State, Nigeria from 9th to 12th of October, 2019 with the theme: 'Anatomy Education: Implications for National Development'.

Convenient cluster sampling was used such that all conference participants who were faculty members and were willing to take part in the study were included. The primary instrument employed in this study was a self-designed questionnaire. The development of this instrument involved an initial preparatory phase, a pilot study phase, and a final revision phase. During the preparatory phase, a rigorous literature search was performed and published studies concerning anatomy as a discipline, its teaching, learning, educators, as well as learners from Nigeria and other countries were revised. A simple questionnaire was then created to evaluate anatomy educators in Nigeria. The questionnaire was designed to apply to all faculty members who teach anatomy in Nigerian universities and allied tertiary health institutions. All of the questions were formulated to match the common characteristics that are representative of educators around the world. The questionnaire was written in simple and clear English.

Questions to assess the socio-demography, academic/scholarship, and occupation of the educators were also added to collect data regarding their general characteristics, as well as identify possible training gaps, if any. The questionnaire was subjected to internal revision to ensure its validity. Revisions were made by Dr. Titilola Obilade, a medical education expert, who reviewed the significance of each question and the latter's overall inclusion of the applicable aspects necessary to assess the general characteristics of anatomy educators. A pilot study was later done on three (3) anatomy educators to check the consistency of the questionnaire. Any vague or confusing items were modified accordingly. The final revision was then used in the primary study.

Fifty-nine (59) out of the 84 faculty members in attendance volunteered to participate in the study, representing a response rate of 72.24%. However, 3 questionnaires were deemed invalid due to incomplete filling. The data were entered and analysed using IBM SPSS Statistics (for Windows) Version 22.0. (Armonk, NY: IBM Corp.). The frequency distribution and summary statistics were analysed using descriptive analysis and results were presented as means, modes, and percentages.

Results

Socio-demographic

Out of the 56 respondents, 38 (67.9%) were males and 18 (32.1%) were females. Majority of the respondents were in

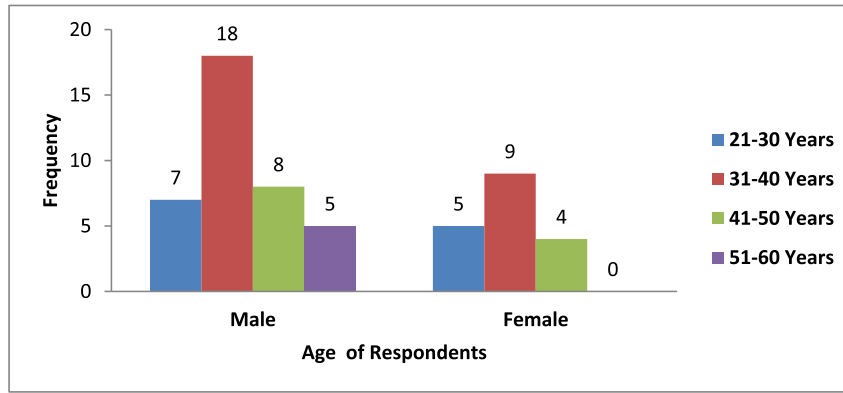


Figure 1: Frequency of respondent's age according to gender.

the '31–40 Years' age range with a frequency of 27 (48.2%) while the '51–60 Years' age range had the lowest frequency of 5 (8.9%). Both the '21–31 Years' and '41–50 Years' age ranges each had a frequency of 12 (21.4%). A further breakdown of the age distribution among male and female respondents is presented in Figure 1.

Academics/scholarships

In terms of academics and scholarships, aside from the 25 respondents (44.6%) who had terminal degrees (i.e. PhDs), 30 respondents (53.6%) aspired to obtain a higher degree in anatomy. However, one respondent (1.8%) did not aspire for a higher degree. In terms of study grants, scholarships, or financial aids, while pursuing studies in the field of anatomy; 23 respondents (41.1%) received some form of financial support while studying as students while 33 (58.9%) did not receive any.

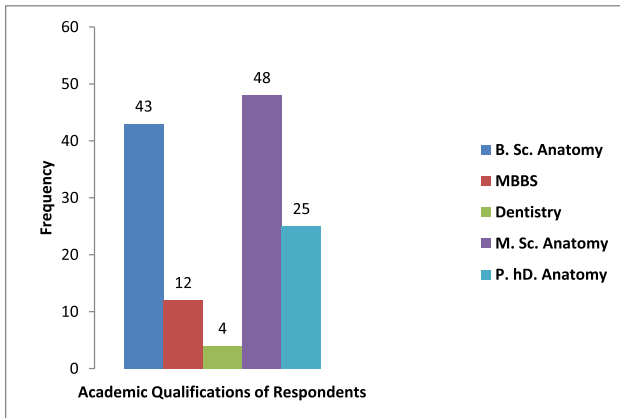


Figure 2: Academic qualifications of respondents.

Figure 2 represents the respondents' various academic qualifications (first degree). Forty-eight respondents (85.7%) hold a master's degree (M.Sc.) in anatomy in addition to their first degree and 25 respondents (44.6%) hold a doctoral degree in anatomy. Among the respondents who had not yet acquired a Ph.D., 48 aforementioned respondents (42.9%) were currently enrolled in a postgraduate degree in anatomy while 7 (12.5%) were not currently enrolled in any programme. Concerning postdoctoral training of the respondents, only 2 Ph.D. holders (8%) had a form of postdoctoral training.

The research interests of the respondents were as follows: 29 (51.8%) respondents were focusing their publications in the areas of neuroanatomy and neuroscience. On the other

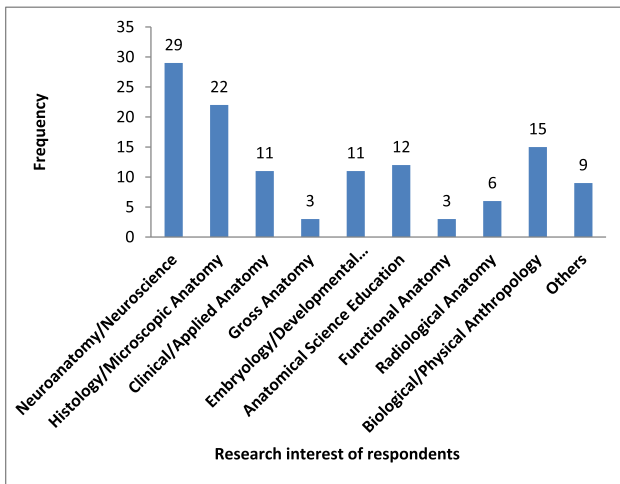


Figure 3: Research interests of respondents based on their publications focus areas.

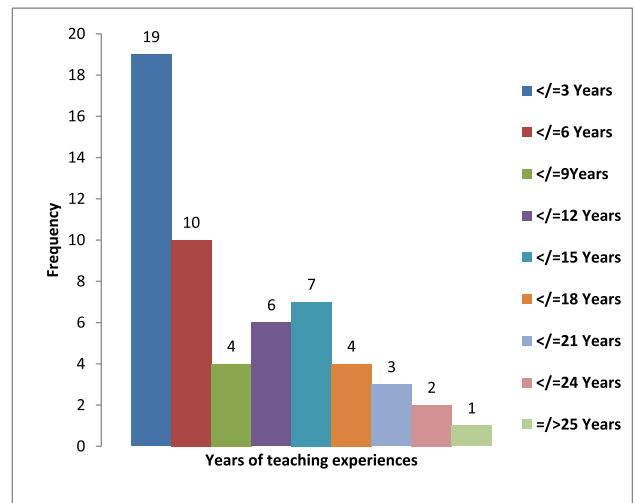


Figure 4: Years of teaching experience of respondents.

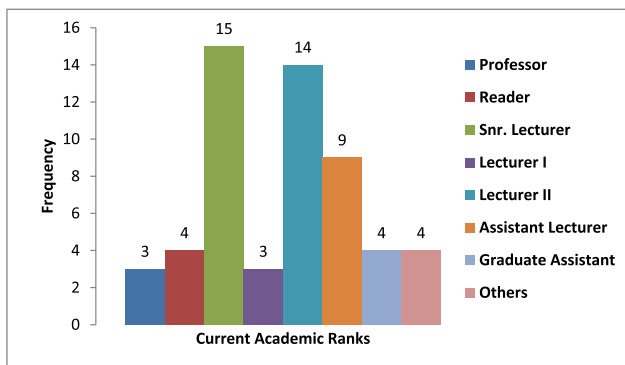


Figure 5: Current ranks held by anatomy respondents at their institutions.

hand, the areas of interest with the least publications were gross anatomy and functional anatomy, which both had 3 respondents (5.4%) each. A detailed representation of the research interests of respondents is shown in Figure 3.

Occupational characteristics

Occupationally, 31 respondents (55.4%) were employed in federal government-owned universities, 16 (28.6%) were employed in state government-owned universities, and only 4 (7.1%) were in privately-owned universities. The remaining 5 respondents (8.9%) were from other forms of training institutions (e.g. colleges of health technology or schools of nursing and midwifery). Majority of the respondents (n = 51; 91.1%) were primarily assigned to a designated ‘Anatomy Department’ at their respective institutions. The remaining

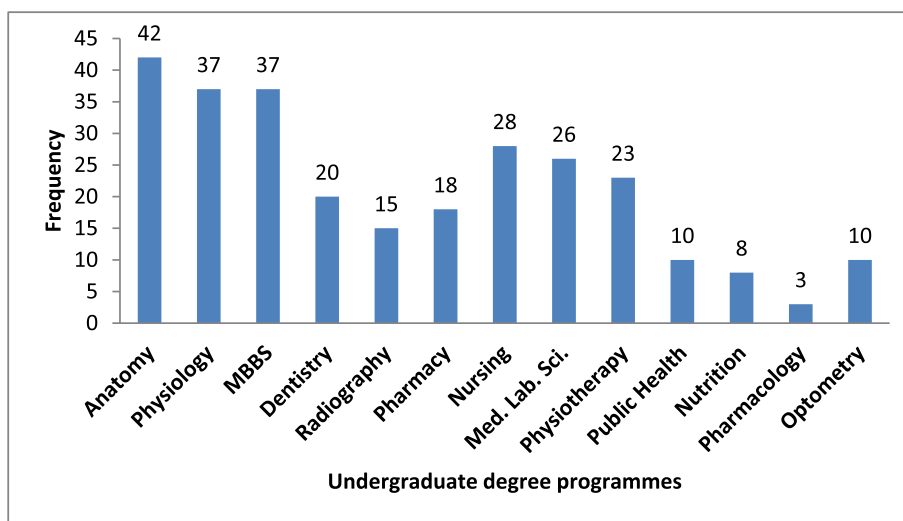


Figure 6: Undergraduate (UG) degree programmes Anatomy educators teach in.

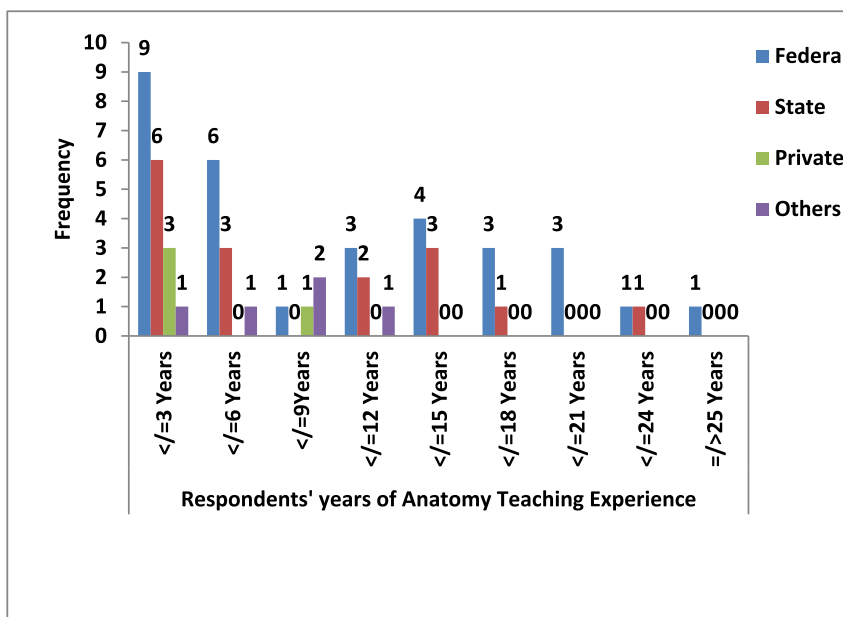


Figure 7: Anatomy respondents' years of teaching experience based on institution type.

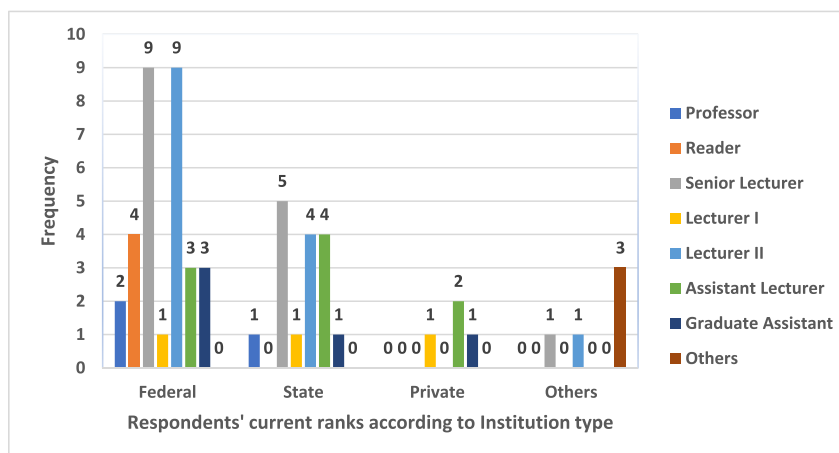


Figure 8: Academic ranks of Anatomy respondents' current ranks according to institution type.

respondents ($n = 5$; 8.97%), who were mostly from non-university institutions, were not employed in a clearly designated 'Anatomy Department' despite teaching the subject. Eleven respondents (20%) reported having a secondary place of assignment aside from working in their anatomy department, while 45 (80%) only held a single post. Among those who held second appointments, 6 respondents (11%) belonged to their respective institutions' anatomy departments on a part-time basis, while 4 (7%) held clinical positions in general practice at privately operated clinics and 1 (2%) in administration.

Figure 4 presents the number of years that respondents have been actively engaged in teaching anatomy, while Figure 5 shows the respective academic ranks that the respondents currently hold in their various institutions of learning. The results indicate that only 3 respondents (5.4%) are currently professors of anatomy while 4 (7.1%) held other non-university ranks.

The respondents indicated they were currently teaching anatomy to various undergraduate (UG) students at their respective institutions. A detailed representation of these various UG programmes is shown in Figure 6. In addition, 22 respondents (39.3%) were also teaching postgraduate degree programmes, 30 (53.6%) were not teaching any programmes, and the remaining 4 (7.1%) mentioned that it was not applicable to them. The breakdown of those who were teaching in postgraduate programmes indicates that 20 respondents (90.9%) were teaching students undergoing an M.Sc. degree students, 4 (18.2%) were teaching M.Phil. students, and 15 (26.8%) were teaching and supervising Ph.D. students.

The results also show that more respondents from federal government-owned universities had a secondary place of assignment (7 or 22.6%) compared to those from state government-owned universities (1 or 6.2%). Only 1 (20%) respondent from a non-university institution had a place of secondary assignment while none of the respondents from privately-owned institutions had any. Figures 7 and 8 show the respondents' years of experience in teaching anatomy and their corresponding academic ranks according to their institutions, respectively.

Discussion

The study examined the characteristics of anatomy educators in Nigeria in order to identify possible training needs. All stakeholders, including faculty members, students, curriculum developers, research bodies, and proprietors would find this helpful in reshaping their departments and staff-training needs.

This study's findings suggest that anatomy professionals are predominantly male. The study of Morgan, Plaisant, Lignier, and Moxham on sexism and anatomy¹⁶ argued that male dominance in teaching anatomy fosters negative beliefs, values, and norms relating to gender, which may persist even after graduation. The above-mentioned study¹⁶ also reported that many students were unaware of the potential adverse effects of sexism. Although there is no evidence of the actual proportion of males to females in anatomy, encouraging more females to take up the profession would help foster a positive attitude towards gender among students.

In terms of age, anatomy educators are mostly middle-aged, mid-career individuals, as reflected in their years of teaching experience and current academic ranks. This offers an advantage to this age group, as they are enthusiastic about scholarship and academic pursuit. The above findings demonstrate their aspirations, which are evidenced by high rates of enrolment into various anatomy postgraduate degree programmes (e.g. M.Sc. or Ph.D.). A study conducted on anatomy educators in the United States showed that 55% of them held doctoral degrees inclusive of Ph.D. and other doctoral degrees, 39% held master's degrees, and 45% had undergone some form of postdoctoral training.¹⁷ This is against the 8% with postdoctoral fellowships, 44.6% with doctoral degrees, and 85.7% with master's degrees in the present study. Although partial funding is available for academic sponsorship, several academics still do not have access to such funding; therefore, their studies are still largely self-funded. These funding and other related opportunities could be extended to Ph.D. holders to further develop their teaching and research skills. These could be in the form of research and/or travel grants and postdoctoral

fellowships. The advantages of postdoctoral fellowships are well-documented in several studies.^{18,19}

There is ongoing debate as to who exactly is most qualified to teach anatomy. So far, no consensus has been reached and there is no clear evidence that suggests negative consequences resulting from who teaches anatomy.²⁰ The Human Anatomy & Physiology Society (HAPS), American Association of Anatomists, American Association of Clinical Anatomists, and American Physiological Society jointly recommended that a relevant master's degree with no less than 18 credits of relevant coursework should be the minimum requirement for anatomy educators.²¹ This study emphasises the lack of medically qualified anatomy educators as well as the low number of medical students who are interested in a career as an anatomy teacher.^{13,14}

Evidence from this study shows that a Bachelor of Science (B.Sc.) in Anatomy is the principal source of anatomy educators. These classically trained anatomists also exhibit a strong and unwavering interest in academia through the acquisition of higher degrees and impressive career progressions, which are evidenced by their current ranks. This situation is no different from other countries such as Scotland and Netherlands where anatomy is mostly taught by non-medically qualified faculty.^{22,23}

To make up for the increasing student-to-staff ratio as observed by Kramer, Pather, and Ihunwo,⁷ the current practice of maintaining departments with both medical and classical anatomists must be advocated. However, sufficient clinical components—possibly with some clinical rotations—should be included in the curricula of classical anatomists to better equip them in their future careers. An earlier study conducted in Nigeria in 2012²⁴ reported that students have suggested the inclusion of similar medical/clinical postings. In line with this, the deliberation of the ASN to change the present Bachelor of Science in Anatomy to a Bachelor of Medical Science is a welcome development.²⁵

Neuroscience is a particularly popular research interest among the respondents. This fascination with the brain may be associated with the numerous initiatives of the International Brain Research Organization (IBRO) through its TReND in Africa research/neuroscience schools.²⁶ The funding offered for research projects, among other incentives, is a potential attraction. The interest in ultrastructure can be associated with the extensive research on phytomedicine aimed at identifying the therapeutic properties of locally consumed herbs for various regional ailments. Funding for research activities in other areas of anatomy will also definitely encourage more individuals to take interest in them,²⁷ thereby ensuring that research is properly distributed across all areas.

In addition, most anatomy educators notably came from public institutions. Although more public universities offer programmes that require anatomical knowledge, the numbers of those from private and non-university institutions are considerably less compared to accredited schools or departments. So much so that educators in public universities are more experienced and advanced in their careers according and thus hold greater potential for mentoring younger faculty members, especially in private universities and other institutions. The benefits of such mentoring could

have profound implications on the knowledge transfer and productivity of the younger faculty members.^{18,28} Such interactions would lead to more opportunities for immediate and future collaborations.

Furthermore, anatomy educators were found to engage in teaching a variety of programmes across different settings. If the different unique points of these programmes are taken into consideration during the training of anatomy educators, it would mean a better learning experience for students in those programmes.

Study limitation

Despite the Anatomical Society of Nigeria (ASN) being the largest umbrella body of anatomists in Nigeria, not all members attended the 16th Annual National Scientific Conference. Consequently, the sample size did not cover anatomy educators from all institutions across Nigeria; therefore, the results cannot be generalised.

Conclusion

The anatomy profession in Nigeria is promising, especially due to its young and vibrant faculty that is enthusiastic about academics and scholarship. Given that anatomy is a cornerstone in healthcare practice, a well-trained and equipped faculty would undoubtedly help provide great learning experiences for students, which will translate to safe practice administered to patients in the clinics.

This study found that anatomy professionals in Nigeria are mostly middle aged and mid-career individuals. In addition, their most common qualification is a master's degree and only a few hold doctoral degrees with little to no postdoctoral experience. Their research focuses are also concentrated in a few areas of anatomy. These findings therefore reveal an urgent need to address the existing training and research gaps.

Recommendations

First, funding for scholarships and research should be made available to faculty members. Moreover, additional opportunities and support for specific research areas should be provided to encourage interest in the said areas. Second, the activities of the Anatomical Society of Nigeria (ASN) should be expanded beyond teaching faculty in universities to other areas where anatomy professionals practice (e.g. research laboratories, schools of nursing and midwifery, colleges of health technology, etc.).

The ASN should also liaise with relevant regulatory and accrediting bodies of respective healthcare-providing programmes to ensure that those who teach anatomy in universities and related learning institutions are properly qualified to do so. This can be achieved through mandatory licenses, continuing professional development (CPD), and subsequent periodic verification. Such practices are needed to safeguard against quackery and ensure that all students in their respective programmes are sufficiently equipped with the necessary anatomy knowledge to safely practice in the society. Lastly, owing to the limitation in sample size, a more extensive national audit of anatomy educators and a possible

expansion of the study to other African countries are recommended.

Source of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

There is no conflict of interest.

Ethical approval

The ethical approval for this study was obtained from the Ethical Review Board of the Nile University of Nigeria, Abuja with approval number NUN/ERB/2019/150. This study was conducted and in accordance with the Declaration of Helsinki.

Consent

The participants were advised regarding the objective of the study and they provided informed consent prior to their participation.

Authors contributions

TC conceived and designed the study. OIO conducted the study and identified suitable research instruments. All the authors collected, organised and analysed the data, and interpreted the results. They also all wrote the initial and final drafts of the article, critically reviewed and approved it, and are responsible for the content and similarity index of the manuscript.

Acknowledgment

The authors wish to acknowledge the constructive criticism and suggestions of Dr. Titilola Obilade regarding the questionnaire design. Miss Utibe Udonwa and Professor Godson E. Anyanwu are deeply appreciated for their assistance in distributing the questionnaire. Not forgetting the authors' statistical consultant, Mr. Phinahas Atsuku, for his valuable insights.

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How to cite this article: Chia TI, Oyeniran OI. Determining the anatomy of anatomy educators. *J Taibah Univ Med Sc* 2020;15(2):102–109.