



Anatomy education in Nigeria: Challenges and prospects

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ABSTRACT

Anatomy is an all-time important subject in all healthcare professions globally. It is widely taught in Nigerian institutions of higher learning offering programs in medical and allied health sciences. This paper aims to provide an overview of Anatomy Education as practiced in Nigeria today, enumerating the challenges facing it and its possible future prospects today. We explored major databases such as PubMed MEDLINE, Ovid MEDLINE, Web of Science, and Science Direct, from January 1992 to June 2019, using selected keywords to identify and extract articles relating and peculiar to Anatomy education in Nigeria. This review yielded 50 publications with 30 meeting our quality and inclusion requirements. This paper highlighted some of the issues that bedeviled the teaching and learning of Anatomy to include lack of an Anatomy Act which makes room for contemporary challenges, scarcity of cadavers, manpower shortages, and lack of requisite skills, insufficient funding, and obsolete facilities and equipment. In conclusion, the teaching and learning of Anatomy in Nigeria is plagued with a series of challenges. It is therefore recommended that there is the need to periodically examine the status of anatomical science education in Nigeria with the view to improve in its areas of weaknesses, which if addressed would have the potential to revolutionize teaching and learning of Anatomy in Nigeria and in the long run healthcare delivery as a whole.

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Introduction

Knowledge of Anatomy remains the foundation for all medical and allied medical sciences involved in providing healthcare [1]. Every student of the health sciences is expected to have some training in Anatomy [2]. This is arguably true because Anatomy is the language of medicine and is the basis for all therapeutic and clinical procedures [3]. Hence, the discipline was referred to as “the physics of medical sciences” [4]. Consequently, Anatomy as a field of study is compulsory in the early stages of all healthcare training programs in Nigeria, as obtainable in most countries in the world.

Clinicians, anatomists, and even students concur that perfect knowledge of Anatomy is indispensable for safe and efficient clinical practice [5,6]. Therefore, a clear understanding of the issues involved in the teaching and learning leading to improvements in Anatomy education will produce

enormous positive results for all professionals in the health sector. Insights on Anatomy education are essential to address issues related to its efficient teaching and learning and the limitations thereto as well as offer potential solutions to the same. This paper is a review of issues that bedevil Anatomy education in Nigeria as well as attempts to propose methods of curbing them.

Methods

We explored major databases such as PubMed MEDLINE, Ovid MEDLINE, Web of Science, and Science Direct, from January 1992 to June 2019, using selected keywords to identify and extract articles relating and peculiar to Anatomy education in Nigeria. This review yielded 50 publications with 30 meeting our quality and inclusion requirements.

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Anatomy Education in Nigeria

The Anatomy Act of Nigeria is a statute which enables the practice of anatomy in schools, permits medical practitioners, superintendents of schools of anatomy, teachers in such schools, or any student attending such schools to anatomically examine or dissect received bodies [7]. It was enacted on March 30, 1933.

Anatomical studies started in Nigeria as a subject in medicine at the then Higher College, Yaba, Lagos, as far back as 1930 [8]. Over the next decades, the study of Anatomy in schools has expanded. The subject is taught not only in colleges but in public (both federal and state-owned) and private universities as well. So far, 32 public and private universities in Nigeria offer programs leading to the award of bachelor's degree in Anatomy, while 53 schools offer programs in medicine or dentistry which have Anatomy at its core [9]. Additionally, universities offering programs in other allied medical and health-care programs such as Nursing, Pharmacy, Medical Laboratory Sciences, Physiotherapy, Environmental Health, Optometry, Radiography, Human Nutrition, Public Health, Pharmacology, Physiology, among others are required to take courses in Anatomy [10]. Postgraduate studies in Anatomy are carried out in a few universities at masters and doctoral levels. The master's program spans between 18 and 24 calendar months depending on the university while the doctoral lasts a minimum of 36 calendar months. Entry requirements into the master's program include a bachelor's degree in Anatomy or Bachelors of Medicine and Bachelor of Surgery or Dentistry and other allied health sciences. Moreover, Anatomy is also studied at specialized institutions or monotechnics such as Colleges of Health Technology and Schools of Nursing which train manpower for the primary health care sector.

Generally, the content of Anatomy is divided into Gross Anatomy, Histology, Embryology, Neuroanatomy, and Genetics. However, the extent of content and depth of coverage for each program varies widely depending on individual program curricula as determined by the National Universities Commission (NUC) and other respective regulatory councils. For instance, students pursuing the Bachelor of Medicine and Bachelor of Surgery degree are required to take 18 hours of anatomy contact on a weekly basis over a period of 45 weeks [11]. These contact hours are spread across lectures, practical sessions in gross anatomy, and histology as well as tutorials.

Typically, faculty members consist of professional Anatomists and Medical Doctors. The primary mode of studying Anatomy in Nigerian institutions and most of the other parts of Africa is by didactic lectures and whole body dissections [12].

Challenges of Anatomy Education in Nigeria

Enabling law

Though the Anatomy Act of Nigeria was enacted in 1933, the law has major deficiencies which are yet to be addressed. Largely, the current law appears to be obsolete in view of recent developments in Anatomical sciences since the law was enacted over 80 years ago. For instance, the Anatomy Act did not make any clear procedures for voluntary body donations for medical education [13]. Others include lack of a regulatory authority to oversee the anatomy practice, absence of licensed superintendents even though the law made mention of it, etc. Anatomy professionals in Nigeria are of the opinion that the law is out-of-date and need major changes to meet up with current global trends. They were of the notion that the Anatomy Act be amended to capture body donation as well as establish a Council for regulating Anatomy professionals among others [14].

Shortage of anatomy teachers

The most obvious challenge is the shortage of Anatomy teachers [3,15], which is evident in both public and private universities across Nigeria and other sub-Saharan countries (with the possible exception of South Africa). A global surge in the number of students taking anatomy courses means more challenges in anatomy education [16]. This is evidenced by the increased number of accredited colleges and faculties offering programs in health sciences in Nigeria. It is reported that the staff-student ratio in major departments of Anatomy in Nigeria is 1:15–35 [17]. This ratio falls short of the NUC's recommendation of 1:10 [10]. It cannot guarantee sufficient student-staff interaction which certainly has adverse implications for learning [18]. Ensuing from the above may be some form of "quackery" where the people who do not have the requisite qualifications for teaching the subject are found doing so in an attempt to make up for insufficient faculty.

Scarcity of cadavers

The cadaver is a vital tool for learning anatomy, research, and for developing clinical skills among others [19,20]. Despite being the cornerstone for learning anatomy, the sourcing, storage, and

management of these cadavers remain a problem in Nigeria [21,22]. Over the years, there has been an increasing demand for cadavers in medical institutions. At the moment, there is no known body donation program in Nigeria. The main source of cadavers still remains unclaimed bodies, often of accident victims or felons, which are donated to the schools by the government [21,23]. A major point of concern is the inability to ascertain how long such bodies have been stored in the morgues before they are supplied to schools for the purpose of teaching and learning. Furthermore, because these are felons or accident victims, there is the likelihood that some body parts may be badly mutilated or even missing. Dissecting cadavers with missing or mutilated parts will prevent the students from appreciating the lessons taught with such bodies, as compared to fresh and whole bodies. Similarly, a study carried out in Ibadan, Nigeria revealed that an overwhelming majority of the cadavers are usually male [23]. Thus, optimal learning is hampered, as the students are more exposed to and thus become more conversant with male anatomy which differs significantly from that of females. In reality, when they qualify as clinicians, their patients will be both male and female.

Standard storage facilities

Closely related to the above is the management and storage facilities for the cadavers. Currently, there are no training programs in mortuary science in Nigeria. Staff working in anatomy laboratories are typically attendants who are mostly trained while on the job and with little or no continuous training and re-training afterward [24,25]. Thus the question of their capacity to properly manage the cadavers becomes important.

Nonexistence of plastination

Plastination is now recognized as a useful method of learning Anatomy [26]. Various authors have indicated that plastination has wide application in teaching and learning of anatomical sciences among others [27]. It was postulated that plastination is a novel approach to solving the problem of cadaver scarcity in Nigeria [20]. Advantages of using plastinated bodies for teaching, learning, and research include lack of the choking odor that usually accompanies formalin-fixed cadavers which is usually unsuitable for asthmatic students and the fact that plastinated bodies last longer while still maintaining their fresh appearance. However, so far there are no known laboratories with the plastinated specimen in Nigeria [28]. The paucity of skilled

personnel to carry out the technique, the duration taken to complete the process, and the cost implications are some of the setbacks to the practice of plastination in Nigeria [20].

Teaching facilities

Other challenges facing Anatomy education in Nigeria according to a study conducted among medical students include are lack of teaching facilities, laboratory consumables, inadequate number of academic and technical staff, little time allotted for study and transportation [29]. Anatomy teaching and learning is best achieved through audio-visual means [30]. Essential facilities include anatomical models, laboratories, microscopes, cameras, microtomes, tissue processors, cryostats, computers, projectors, dissection tools, etc. The anatomy museum is expected to be stashed with manikins to augment cadaver dissection as a tool for learning. However, many institutions due to insufficient funding are unable to procure these manikins in sufficient quantities to meet up with the number of students. Even when some of these are available, they are sometimes obsolete or not in their best working conditions. If these are lacking in anatomical museums and laboratories, meaningful teaching and learning may not be achieved and thus result of anatomy exams may be greatly affected.

Conclusion

Anatomy as a vital subject for healthcare professionals is widely practiced in Nigeria. However, the teaching and learning of Anatomy in Nigeria and most sub-Saharan countries (with a possible exception of South Africa) is plagued with a series of challenges. While useful recommendations have been advanced to address these challenges, there is also the need to periodically examine the status of anatomical science education in Nigeria with the view to improve in areas of weaknesses. If these recommendations are put in place, its consequences will be far reaching on Anatomy education and the entire health sector in Nigeria.

Recommendations

1. It is important to amend the current Anatomy Act of Nigeria to start with. The amendment of the act should reflect contemporary global best practices such as voluntary body donation among others. Similar regulations enacted in other developed countries of the world have seen major improvements in

sourcing cadavers through voluntary donations. Such an amendment should be followed by aggressive public awareness campaigns on the importance of body donation for anatomical studies. To further encourage voluntary donations, special recognitions can be given to body donors or their families from time to time in a gathering organized by the regulatory body for anatomical education in Nigeria. The amendment should also eliminate the bottlenecks currently faced in the process of obtaining cadavers for anatomical study as well as shorten the duration within which mortuaries can hold unclaimed bodies before releasing them to institutions for anatomical studies.

2. Since plastination appears to be the ultimate solution to the scarcity of cadavers, government and regulatory bodies should provide the necessary education and skills to Laboratory Technologists on plastination techniques. Committing enormous funds in training personnel and procurement of other materials for plastination will still be cost-efficient in the long run as plastinated specimen may not be needed frequently. Professional societies can also occasionally organize training or workshops for staff on relevant techniques.
3. There is a need to encourage the training of professional anatomists from the undergraduate to postgraduate levels. Subsequent absorption into faculty positions should not be limited to medically qualified personnel only. Furthermore, the amended Anatomy Act should stipulate the requisite qualifications for those involved in the practice. Similarly, a regulatory body should be set up to regulate Anatomy practice in Nigeria instead of vesting such authority on the minister of health as in the case currently. The regulatory body will also have powers to issue practicing licenses to deserving individuals who are duly trained and sanction erring persons appropriately. Stricter monitoring of the same for compliance should be ensured and erring persons/institutions appropriately sanctioned especially as regard the employment of non-professionals in teaching or practice of Anatomy.
4. Increased funding for departments will ensure adequate supply of facilities that are greatly needed for proper anatomy

education. Government interventions such as the Tertiary Education Trust Fund (TETFund) can specifically allocate resources for some of the issues raised, particularly sponsorship of staff to learn plastination skills and other modern methods of running the anatomy laboratories as practiced in more advanced economies. Procurement of especially female manikins should be encouraged in order to supplement the shortage in cadavers and plastinated bodies for study. Increased funding will also ensure the provision of critical facilities such as audio-visual aids as well as facilitate logistics when cadavers are secured.

Conflict of interest

There is no conflict of interests among the authors.

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