

PHYSIOLOGIST AS A PROFESSIONAL: THE MINDSET, MISCONCEPTION, AND REALITIES

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ABSTRACT

The problems associated with training undergraduate human physiology students is not inherent in the discipline *physiology*, but in the curriculum design, implementation, and actual training. It is definitely unheard of to see a trainer who does not define for sure, the direction and functional application of the so-called training for trainees. Indeed, it is disheartening to note that despite all the advancements in the field of physiology, the training of physiology students in Nigeria does not include defined skill acquisition towards the operation, utilization, and maintenance of physiologically relevant equipments, accessories and consumables. These issues however, revolve around the intent of the training as enshrined in the curriculum. In view of the experiences encountered by physiology students in Nigerian Universities, this presentation examines the issues in contention and the probable solutions that may go a long way in correcting the entrenched mindset/misconception about the fate of physiology graduates in Nigeria.

Key words: Mindset/Misconception, Medicine, Nigeria, Physiology,

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INTRODUCTION

Physiology, derived from the ancient Greek words *physis* (meaning "nature; origin") and *logia* (meaning "study of") and coined by *Jean Fernel* in 1525, is the scientific study of function in living systems (Prosser, 1991). Available literature has it that the study of human physiology dates back to at least 420BC and the time of Hippocrates -*the father of medicine* (Prosser, 1991). Also, the critical thinking of Aristotle and his emphasis on the relationship between structure and function, is believed to mark the beginning of physiology in Ancient Greece, while Claudius Galenus (c. 126–199 AD) known as Galen -*the founder of experimental physiology*, becomes the first to use experiments to probe into the function of the body (Fell and Pearson, 2007).

The knowledge of physiology grew rapidly in the 19th century, particularly in 1838 when the Cell theory was propounded by Matthias Schleiden and Theodor Schwann. They stated that organisms are made up of units called cells (Maton et al, 1997). Further discoveries of Claude Bernard's (1813–1878), ultimately led to the concept of *milieu interieur* (internal environment), which was later championed as "*homeostasis*" by the American physiologist Walter Cannon (1871–1945) (Cannon, 1926). It was a

major aspect of physiology that defined the interactions within an organism.

THE STUDY OF HUMAN PHYSIOLOGY

Academically, the study of human physiology involves the integration of knowledge across many levels, including biochemistry, cell physiology, organ systems, and the body as a whole (Buskirk, 1997). It has been recognized that contemporary research in human physiology explores new ways to maintain or improve the quality of life (Tipton, 1998), development of new medical therapies and interventions (Boone, 2010), and charting the unanswered questions about how the human body works (Boone, 2010).

It is believed that a degree in human physiology prepares students to be critical thinkers who can come to independent rational conclusions regarding their own personal health and who can use the guiding principles of scientific thinking and inquiry as a model for understanding the world around them. Available evidence show that at undergraduate level, majority of students aspires to be professionals in health-science fields such as medicine, physical therapy, occupational therapy, nursing, dentistry, pharmacy, education, and research (Boone, 2010).

Overall, the human physiology program in Universities provides the scientific foundation necessary for professional studies in medicine, physical therapy, and other health-science fields. In addition, graduate work in the field of human physiology provides opportunities to conduct cutting-edge research, teach the next generation of scientists and medical professionals, and share the excitement of science with the general public (Boone, 2008).

Unlike in developed countries (e.g. America, Britain, and Canada), most of the students studying physiology as a degree options in Nigeria, never wished to do so as they would have preferred studying Medicine, Dentistry, Pharmacy, Nursing, or Medical Laboratory Science; with Medicine being the most preferred. This is not unconnected to the entrenched mindset and misconception about the fate of physiologist, as well as the classification of University courses as "Professional" and "Non-Professional" courses; which seemingly appears to be redefining the term "Profession" from which the term "Professional" was derived. These had induced different forms of segregation, disillusionment, frustrations, and to a greater extent, depression amongst such students (Boone, 2010).

THE CHALLENGES

From the foregoing therefore, it is glaring that there are so many challenges faced by most of the Nigerian students studying physiology in colleges of medicine across the country. To this effect, internet socio-media is awash with comments and criticisms; all of which points to the skewed manner by which the various challenges are handled. In fact, a lot of these challenges have been attributed to the following:

1. The relative low awareness about *Physiology* as a discipline.
2. The ignorance about the fate and potentials of a trained physiologist.
3. The lack of knowledge that graduates of this discipline can be useful in the Nigerian society especially the health sector.
4. The obvious disregard by relevant authorities that trained physiologist has important roles in the Nigerian Society especially the health sector.
5. The inertia and lack of will on the part of relevant authorities in Nigeria to positively allow changes in the societal and health structures that have not been truly efficient since independence.
6. The lack of innovative policies by the custodians of physiology training in Nigeria.
7. The overall apathy towards introducing innovation strategies.
8. The visible and obvious lack of career-future guarantees

THE OPPORTUNITIES

Well trained physiologists can work in hospitals, rehabilitation centers, wellness centers and clinics, as they constitute a type of health care providers who work closely with doctors and other medical personnel towards improving overall patient's physical condition. According to Anderson and Horvath (2004), patients seen by physiologists also include those with cardiac and chronic diseases like hypertension and diabetes. However, the American Society of Exercise Physiologist (ASEP, 2011), acknowledges that there are different categories of physiologist based on several criteria like type, importance, duties, and training focus as shown in table 1 and 2.

Table 1: CLASSIFICATION OF PHYSIOLOGIST AND TRAINING FOCUS (ASEP, 2011)

S/N	TYPE	TRAINING FOCUS
1.	Exercise physiologist	Exercise, such as the risks and benefits of cardiac rehabilitation programs
	Sports physiologist	Body functions in athletes, such as endurance and performance issues
	Cardiac physiologists	Investigations of the heart. Neurophysiologists study the nervous system
	Neurophysiologists	Topics dealing with the brain and the central nervous system.
	Respiratory physiologists	Topic dealing with issues with the respiratory system.
	Research physiologists	Innovative science/medical research to improve on the treatment of diseases.

Table 2: PATIENT’S NEED AND THE DUTIES OF A PHYSIOLOGIST (ASEP, 2011)

S/N	PATIENT’S NEED	PHYSIOLOGIST’S DUTY
1.	Clinical Assessment	Physiologists participates in the assessment of patient’s physical condition as an important part of proper diagnosis using a variety of equipments to measure heart rate, pulse, oxygen and blood pressure. The equipment used for these tests includes an electrocardiogram machine to measure heart rate; a blood pressure cuff to measure blood pressure; and a pulse oximeter to measure the flow of oxygen through the blood.
2.	Treatment	Physiologists create an activity prescription which can range from increasing the patient’s lung capacity to strengthening his muscles, including the heart muscle. Utilizing the knowledge of how the body works and how different exercises affect the body to create an activity prescription that addresses the patient’s physiological needs.
3.	Monitor	The majority of patients, who sees a physiologist, carry out their activity prescriptions in a hospital setting under close supervision by medical professionals. Prior to the activity, medical staff connect each patient in the activity area to monitoring equipment similar to what is used for assessment. This equipment works with a computer to relay information on each patient to the physiologist. He or She uses this information to determine whether or not the patient needs to increase or decrease his activity level. Too much activity can cause injury to the patient and too little does not benefit the patient’s physiological need to gain strength.

DISCUSSION

It is quite clear that the lack of definite focus and academic inconsistencies in the training of some University students leave them with irresolvable psychological trauma that does no one any good. A typical instance is the experiences of young undergraduates in the colleges of medicine studying courses other than Medicine and Surgery. For those studying physiology, the situation is same. They are often forced directly or indirectly to believe that physiology as a first degree option is indeed a waste of time, energy, and resources. They are sold the bitter pill that physiology is not a “*Professional course*” contrary to the views of Boone (2011), but fortunately, the term “*profession*” from which the term “*Professional*” is derived and synonymous with *the line of work, vocation, occupation, job specialization, and career*, is literarily defined as “*any job that needs training*”.

Of course, formal education goes a long way to defining job specifications and in view of that, graduates of physiology must be allowed to learn and practice skills relevant to their training. It is indeed disheartening, to note that even after been made to offer all courses in Anatomy, Biochemistry, Computer Science, Entrepreneurial studies, Pharmacology, and most importantly, Physiology, graduates of physiology still have nothing tangible to show for all their efforts in the University; in terms of

skill acquisition, Job opportunities, Job satisfaction, Self esteemed and relevance in the society.

Obviously, the problem is not in the discipline *physiology*, but in the curriculum design, implementation, and actual training. It is definitely unheard of to see a trainer who does not define for sure, the direction and functional application of the so-called training for trainees. Is it not out of place to note that despite all the advancements in the field of physiology, the training of physiology students does not include the acquisition of skill towards the operation, utilization, and maintenance of these equipments for the benefit of the society at large? Is it not unfortunate that some of such students never saw these physiologically relevant equipments throughout their training in the University?

It is indeed high time we told these students the truth. If the problem is the unavailability of fund to purchase these equipments, then it should be clearly stated. If it is the lack of requisite man-power, then it should as well be clearly stated. Exposing these students to the use of these equipments and their applications definitely would make them acquire relevant one form of skill or the other. It might be in the design and manufacture of such physiologically relevant equipments, accessories and consumables; application, usage and manipulation of such equipments, accessories and consumables for the benefit of the society; maintenance of such physiologically relevant equipments and accessories;

and most importantly, in the utilization and manipulation of such equipments to resolve problems through research that may as well lead to enhancement and further redesigning of the equipments for greater outcomes . Of course, who can fault the fact that the problem is not physiology but the intent of the training enshrined in the curriculum?

In other words, undergraduate training in human physiology can focus on providing students with opportunities to acquire skills in equipment design/manufacturing, equipment application/maintenance, and innovative research. Thus, a review of the curriculum to capture all aspects of physiology - research physiology and clinical physiology will go a long way in enhancing the opportunities of physiologists in Nigeria. More so, the Physiological Society of Nigeria (PSN) as custodians of physiology training in Nigeria needs to be more proactive as regards the realities in question. Similarly, the Student Physiological Association of Nigeria (SPAN) must redirect their energy towards championing this tilt in order to enhance positive attitudinal changes amongst students. In fact, an average physiology student is desirous of an opportunity to serve the society. Such opportunities might be in the military, sports, education, health, administration, and consultancy services.

Specifically, physiologists can function as professors, researchers, administrators, and wellness coordinators in college and university programs (Boone, 2011). They could as well go into community practice as health managers and fitness/athletic program coordinators/instructors. They also have the opportunity to go into clinical practice where they can test and supervise cardiopulmonary patients, children with heart disease, pregnancy, and low functional capacity, as well as the evaluation and supervision of patients with special conditions like diabetes, obesity, rheumatoid arthritis, Dyslipoproteinemia, cystic fibrosis, and hypertension (Anderson and Horvath, 2004). In addition physiologist can serve as occupation rehabilitators, Neurophysiological technician to setup and operate electronic equipments that records electrical activities of the brain, heart and the nervous system (Anderson and Horvath, 2004). Interestingly also, physiologists can function as fitness directors or health managers in the military - Air Force and Army, and in business. Alternatively, they may opt for **private** practice as **personal** health/fitness consultant, sport psychologist, health

risk manager, exercise nutritionist and nutrition counselor (Boone, 2011).

CONCLUSION

From the foregoing therefore, it is clear that opportunities abound for physiologist, only if the training is not defective. Moreover, the highlighted realities are dependent on the foresightedness and creativity potentials of all those involved in the design, implementation, and accreditation of physiology training programmes in Nigeria. In the words of Nwaopara (2013) undergraduate education should be “to get the students trained, make them acquire functional skills, allow them practice those skills under supervision and graduate them to seek for job placement or set up an enterprise that can even employ others”. This indeed is recommended as the launch pad to changing the fortunes of graduates of human physiology in Nigeria.

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AUTHOR(S) CONTRIBUTION

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