



LIVING ANATOMY AND ITS IMPORTANCE IN MEDICAL CURRICULUM

Anatomy

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ABSTRACT

Over the past 20 years, a notable shift has been observed in the way anatomy is taught and learned. To teach and learn living anatomy, advancements in medical technology have made it possible to employ teaching methods such as body painting, physical examinations, medical imaging, and virtual anatomy software. With an emphasis on its pedagogical components and the perspectives of medical educationists and undergraduates, this study examines the historical background and current advancements in the teaching and learning of living anatomy.

KEYWORDS

Living anatomy, Medical education, Medical Imaging, Anatomage, Surface Anatomy

INTRODUCTION

Anatomy lessons using a living human body have been practiced since the eighteenth century. To illustrate how the body moved anatomist, used live models and they emphasized that the explanation of structure and function in living things must be a part of medical education¹. Medical school students were not being given the opportunity to apply the anatomy they had learned in dissection to the living body, which highlighted the need for instructions that promote the use of living anatomy³.

In terms of successful teaching, anatomy has long been regarded as a crucial component of medical education. In conventional anatomy courses, gross anatomy, histology, and embryology are covered⁴. Anatomists also linked the beginnings of classical anatomy education to colonialism. Changes in anatomy education have occurred, including the replacement of cadaveric dissection with prosection, radiographic anatomy, and simulation, and more recently, with the onset of the post-pandemic era, the new virtual learning tools have gained acceptance⁵. The shift from a traditional subject-based approach to integrated system-based modules, the reduction of contact hours, and the change in dissection techniques were all important factors that contributed to the discussion of the significance of creative teaching and learning strategies in 21st-century anatomy education. The term "living anatomy" refers to anatomy education that occurs alongside a human⁶⁻⁸.

Doctors handle the living anatomy of the body, while the dissecting room deals with cadaveric anatomy. There are various methods for teaching living anatomy⁹. Living anatomy now has a recognized place in medical education thanks to the most recent pedagogical developments in anatomy. In addition to covering applied aspects of the human body, the living anatomy sessions aid in understanding natural variations and support spatial orientation of human anatomy¹⁰. Through the use of multimedia innovations and the integration of physical examination, life models, and imaging into their living anatomy sessions, numerous medical schools have modernized their anatomical resources¹¹. The primary goal of this paper is to assess the fundamental understanding, contemporary issues, and perspectives of medical educators and undergraduate students regarding the teaching and learning of living anatomy.

Living Anatomy In Medical Education

Traditional anatomy instruction has undergone a revolution in developing nations, particularly in the COVID-19 era, thanks to advancements in medical technology and the adoption of outcome-based integrated curriculum⁸. In some medical schools, body painting has been used as a teaching tool for anatomy. It began in 2002 and involves painting internal body parts on the skin¹². As technology developed, medical imaging methods such as radiography, 3D CT scans, magnetic resonance imaging, and ultrasounds became useful teaching tools for living anatomy¹³⁻¹⁴. The use of ultrasound in anatomy instruction also seemed to be a useful tool for promoting clinical integration, developing reasoning abilities, and helping students understand body parts in relation to one another¹⁵. Software that offers 3D reconstruction of structures on the surface of a living body can help undergraduate students better understand the spatial relationships of the body and improve their clinical performance when used in

conjunction with other methods like body painting, physical examination, and new teaching strategies like problem-based learning¹⁶.

Because it helps students learn by giving them personalized feedback in communication, examination skills, and enhancing the humanistic value of the body, the use of living models was rated higher than cadavers in the study of surface anatomy¹⁷. Physical examination was found to be an effective learning tool that improved students' abilities to perform clinical examinations in addition to helping them learn anatomy. When combined with other techniques like drawing, surface anatomy, and physical examination, body painting methods help people retain anatomy better¹⁸. Virtual dissection tools like Anatomage, Visual body and complete Anatomy have not only helped students close the knowledge gap between gross anatomy and its clinical applications, but they have also proven to be a dependable learning method during pandemics when in-person instruction completely collapsed¹⁹⁻²⁰. A randomized controlled trial that combined traditional gross anatomy modes with virtual dissection demonstrated improved results. The capacity to study and perceive virtual anatomy was enhanced through the use of haptic technology in conjunction with virtual tools²¹. With the start of the pandemic, the use of online tools and web-based resources was a dependable way to teach anatomy²². Therefore, anatomy teachers must adapt their methods to include new modes in addition to didactic ones. Using ultrasound in gross anatomy classes improved students' understanding of anatomy taught through traditional instruction and gave them more confidence to perform invasive procedures in the future. Its integration with instruction also improved integration. According to studies, teaching students live anatomy through dynamic CT and MR images helps them learn radiology during their clinical years and clerkship. It also acts as a backup in situations where dissection is not an option²³⁻²⁴.

When allotted hours are cut, it can be difficult to properly plan and execute multimodal integrated learning modes in addition to didactic approaches²⁵. Research has, however, demonstrated both the advantages and disadvantages of these novel methods of learning living anatomy²⁶. The size of the group, religious beliefs, gender issues, and body confidence were among the important factors that made students hesitant to take part in body painting sessions. Pupils who participated in physical examinations have expressed discomfort prior to, during, or following the session, particularly when performing on the opposite gender or when it comes to the examination of the breasts and genitalia, even when the genders are similar²⁷. One obstacle to integrating web-based tools in developing nations is the higher cost of virtual anatomy tools and the need for tutors and students to have prior orientation²⁸.

CONCLUSION

Gross anatomy and clinical practice are connected by living anatomy. The limited amount of time available has made teaching anatomy challenging, but it is crucial to strive for the best possible integration of living anatomy into the medical curriculum. In order to teach living anatomy effectively, a multimodal approach must be used, combining them with other modalities such as virtual anatomy, web-based computer-assisted learning, line drawing, and imaging. It is necessary to address the increasing acceptance of imaging and virtual anatomy among undergraduate medical students. It should be successfully

combined with other teaching resources for living anatomy in addition to cadaveric dissection.

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