ORIGINAL RESEARCH PAPER

Anatomy

IMPACT OF COVID 19 PANDEMIC ON ANATOMY EDUCATION- METHODS TO COMBAT THE SITUATION.

KEY WORDS: Covid 19 Pandemic, Anatomy Education, Prosections.

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INTRODUCTION

Readers are aware that the outbreak of the novel coronavirus began in Wuhan, China, in late December 2019 (Zhu et al., 2020), and spread exponentially. in our age where increasing urbanization and frequent international travel allow for the uninterrupted transmission of infectious diseases (Alirol et al., 2011)2p. As governments struggle to contain the vicious spread of Covid-19, and with over a third of the world's population currently under some form of lockdown (Kaplan et al., 2020), the effects the virus has had on people's daily lives is clearly like nothing most people have experienced before. One of the many affected sectors is education (UNESCO, 2020).2p More than 1 billion and 575 million students in approximately 188 countries around the world are reported to have been affected by the closure of schools and universities due to preventive measures taken by countries against the spread of COVID-19 (UNESCO, 2020)1p.Among all educational institutes ,medical colleges were affected badly and this pandemic has had enormous effects on anatomy education (Franchi, 2020).p5. According to the Centers for Disease Control and Prevention (CDC), the COVID-19 outbreak could be of long duration (CDC, 2020), which no one can yet estimate. When students lost access to dissection rooms, they lost access not only to cadavers, but also to a range of other optimal learning modalities: prosections, models, pathology specimens, skeletons, and others (Sugand et al., 2010). To address this gap, the purpose of this study is to explore and describe the new methods of teaching which can make learning anatomy more effective and interesting.

Supplements used to enhance anatomical education

1. **Plastination:** is a technique or process used in anatomy to preserve bodies or body parts, first developed by Gunther von Hagens in 1977.[7] The water and fat are replaced by certain plastics, yielding specimens that can be touched, do not smell or decay, and even retain most properties of the original sample.[8] Outcomes of studies of the use of plastination in anatomy education are limited and are based mostly on students' reactions and perceptions 9. although one study found that plastination was more acceptable to 2nd-year than 1st-year medical students (10,11).

2. **3D Printing:** Three-dimensional printing (3DP) digital models can be made of various materials, e.g., nylon, polyvinyl alcohol, polyacetic acid, acrylonitrile butadiene styrene, wood, metal, and carbon fiber filaments (12). Many authors have compared the test scores after learning using 3DP group with other tools (e.g., text, atlas, 2D images, dried specimens, and disarticulated skulls), and most of them have concluded that the 3DP group is more likely to gain higher scores(13,14,15,16,17,18,19,20).

3. **Augmented reality:** the surrounding environment is actually 'real' and just adding layers of virtual objects to the real environment. The user is then able to interact with both the real and virtual elements of their surrounding environment. It enhances the student's interactions with the real world by projecting spatial information in the form of a virtual object that cannot be directly detected by their own senses (21,22) The most distinctive feature of AR is its ability to represent an anatomical model in three dimensions without losing the sense of the user's own environment (23) One study showed that AR resulted in better test scores than traditional lectures and dissection(24). What makes AR an excellent tool for implementation in anatomical education is that most people already own the devices required to run this technology, which makes AR cheap, readily accessible and not requiring specialized equipment for its use.

4. **Virtual reality:** Virtual reality is an artificial environment that is created with software and presented to the user in such a way that the user suspends belief and accepts it as a real environment. VR has been used and its effectiveness in learning evaluated (25,26,27,28,29,30). One author explained the perceptions of anatomy using 3D skull models and suggested that a desktop could be appropriate for delivering VR resources(31). Interestingly, the authors emphasized that the more important factor was prior knowledge.

5. **Video:** Dissection videos are useful for bridging the gap created by an 11% curriculum reduction(32). In general, students tend to like video learning and report that it enhances their learning satisfaction(33,34,35)

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