

REVIEW ARTICLE

OPEN ACCESS

Background Music: The Missing Stress Antidote in Cadaver Dissection Laboratories

Izuchukwu Azuka Okafor  ▪ Jude Amechi Nnaka 

Department of Anatomy, Basic Medical Sciences, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, Nigeria

Cadaver Dissection (CD) is a longstanding but indispensable method of teaching human gross anatomy. However, there are several kinds of stress associated with CD which could cause learning difficulties amongst students especially in poor-resource countries where standard CD laboratories are in great shortage.

This review highlighted some causes of stress during CD, with a focus on Nigeria as a resource-poor setting. Also, it has proposed background music (BM) as a simple, cheap, and effective alternative that can be used to curb CD-related stress in such settings where cost-effectiveness is prioritized. The possible challenges that may be faced during the incorporation of BM into CD laboratories have also been pointed out, with important recommendations made on how to deal with these challenges.

Keywords: Background music, cadaver dissection, stress, medical education, Nigeria

Introduction

Cadaver Dissection (CD) is a vital part of medical education (1), and is regarded as one of the most effective ways to teach anatomy to medical students and professionals (2). While the strength of CD as an important tool to teach gross anatomy is acknowledged by many (3), CD can be a source of stress and anxiety for students (4). Some of the reported symptoms associated with CD-related stress and anxiety include fear, depression, loss of appetite, feeling of guilt, and sadness (5).

Several interventions have been presented in the past to deal with these stress-related challenges that students face in CD laboratories, for example, the use of live video demonstration to mentally prepare students before initial contact with cadavers (6), substituting formalin for a more suitable embalming chemical, the use of peer teachers – where experienced medical students are employed as tutors in CD classes (6), as well as the integration of audio-visual aids. While some

Corresponding Author: Izuchukwu Azuka Okafor; Dept. of Anatomy, Basic Medical Sciences, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, Nigeria
ORCID ID: 0000-0003-1017-9297

E-mail: okaforizuchukwu33@gmail.com

Received: Oct 4, 2020 **Accepted:** Dec 1, 2020

Published: Dec 16, 2020

This is an Open Access article distributed under the terms of Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, or reproduction in any area, original work is properly cited.

The Ulutas Medical Journal © 2020



of these employed strategies have improved learning conditions to a good extent, they are still unable to sufficiently tackle the issues surrounding CD-associated stress, anxiety, and negative learning experiences (7).

In Africa and Nigeria in particular, CD labs are yet to be optimized for effective and stress-free learning (8). For example, some of the aforementioned interventions such as the use of audio-visual materials are still lacking in many Nigerian CD laboratories (9). Predictably, the CD-associated stress could be more on students and teachers who use unstandardized laboratories. The dearth of friendly CD labs in most African countries has been attributed to poor funding hence, the need to adopt a simple and cost-effective strategy in addressing the stress-related challenges with CD in these countries.

In this review, we have discussed the stress-related issues with CD with a focus on Africa, using Nigeria as a case study and argued that the use of background music (BM) during CD could play the big role of stress antidote even in poor laboratory settings. Also, we have put forward possible challenges that could emerge as a result of implementing the use of BM and made relevant recommendations.

Cadaver Dissection as an Indispensable Anatomy Learning Tool

The knowledge of anatomy is one of the fundamental requisites of medical and allied medical disciplines (10). In times past, the use of CD and didactic lectures has been the sole method of teaching gross anatomy to medical students and professionals (3). However, technological advancements led to continuous reformations of anatomy curriculum and teaching methods, as more institutions embrace and utilize modern technology. The

traditional pedagogy of CD with the help of personal instructors and demonstrators is still considered necessary and indispensable to the training of medical practitioners and anatomy educators (11), even though the incorporation of modern technological approaches like the use of 3D models, imaging, and simulations into anatomy education has been widely accepted as being effective and beneficial (12). The traditional cadaveric dissection is said to be unique, offering a realistic approach to anatomy teaching, as it allows students to familiarize themselves with the texture, structure, and organization of the human body and also gives room for students to compare body structures both in normal and pathologic state (13).

Korf et al. (11) concluded that CD "introduces understanding of three-dimensional anatomy and the concept of anatomical variation", as well as facilitates teamwork among students, and improves manual dexterity. Prolonged and active participation in CD has been linked to the development of core medical competencies such as time management, stress-coping skills, leadership, responsibility, and the development of an altruistic attitude (14). CD remains highly indispensable in the training of physicians and health practitioners, although considered expensive and time-consuming by some (15). Jacob (16) reported that the use of CD in the early stages of medical education is more effective in the retention of information than the simulated alternatives. However, the combination of these methods would strengthen the students' understanding and boost their anatomy learning process. Similarly, Saltarelli and colleagues (17) demonstrated in a quasi-experimental control study that the use of CD showed a significantly higher learning

outcome than multimedia simulation program when measured by the identification and explanation of actual anatomical structures.

Cadaver Dissection and Associated Stress

Exposure to a dead human body, especially for the first time is by no means a comfortable experience (18). Medical students grapple with anxiety and psychological strain that comes with dissecting a human cadaver, while also dealing with the pressure of making good grades (6). CD has been described as unpleasant by students. Emotional responses like fear, anxiety (19), depression, feeling of guilt, and sadness (5) have been reported to be associated with CD.

The stress associated with CD may manifest itself in an array of symptoms ranging from sleeplessness to intense anxiety and palpitations (20), and sometimes with symptoms of post-traumatic stress disorder like recurring visual images of a cadaver. The symptoms may be dependent on the stress response of an individual. Some of these symptoms associated with CD, notably anxiety and insomnia are said to interfere with the academic performance and social behavior of students (18). Similarly, physical inconveniences like the smell of formalin, nausea, and conjunctival irritation have also been noted as major contributing factors to the general stress that students face in the CD laboratory.

In Nigeria, CD is used to teach anatomy to second and third-year preclinical students. Alongside the usual physical and psychological stress associated with CD laboratories already noted (7), medical students in Nigeria and other parts of Africa are faced with other unique, specific issues that further worsens their dissection experience (9). The issue of

unavailability of cadavers for dissection, as well as poor storage and preservation facilities, is one of such challenges. Presently, body donation programs are nonexistent in Nigeria (9) thus, medical schools rely heavily on abandoned bodies of mainly dead criminals and accident victims for CD. This shortage of bodies for dissection consequently leads to overcrowding in CD tables, ultimately causing learning difficulties. Other challenges that may constitute stress in most Nigerian cadaver laboratories include the lack of essential teaching facilities like anatomical models and dissecting tools, and an insufficient number of instructors and demonstrators during dissection classes.

Curbing CD-related Stress: The Background Music Option

The need to improve the learning experience of medical students as it concerns CD has been a major topic of discussion lately (21). Different ideas and strategies have been presented and employed in the past to deal with the mental and physical challenges that students face in dissection halls. Some changes such as, substituting formalin for a more suitable embalming chemical, preparing students mentally and physically before initial contact with the cadaver, as well as the integration of electronic tools and resources in CD laboratories (8) have been recommended and employed, especially in developed countries, to enhance the learning experience of students. While these interventions have shown some promise towards improving general learning outcome of students (12), it is still not enough to sufficiently handle the issues of anxiety-induced learning difficulties in the dissection laboratory.

The use of BM is a modern approach to curbing stress during CD and has been incorporated into medical education to create a holistic learning environment (22). Previous studies on stressful settings have found the use of BM to have a stress-reducing effect, and effective in managing anxiety (23). Music as a therapy has been demonstrated to be effective in reducing anxiety and depression levels in patients with a generalized anxiety disorder (24). Lai and Li (25), found music intervention to be beneficial in reducing self-perceived stress among nursing students. Furthermore, many reports have also found the use of BM to be beneficial in several cognitive functions. In education, the use of BM was found to have a positive influence on students' focus and learning capacity, as well as the speed and accuracy of spatial and linguistic processing (26). A study concluded that listening to music substantially reduced physiological stress responses arising from anxiety in mechanically ventilated patients (27). In a recent survey, Bellier and coworkers (28) demonstrated that the use of BM had a significant impact on both the technical and theoretical performance of students in an anatomy examination. Despite the pieces of evidence supporting the positive impacts of music on stress, anxiety, and general performance in academic settings and even with studies showing that students strongly embraced the idea of incorporating BM into CD, the use of BM in CD laboratories is yet to be fully explored in most countries in Africa, including Nigeria. Presently, there is no known literature on the exact number of medical institutions in Africa that have fully incorporated the use of BM during CD.

One of the many upsides of using music as a stress-reducing intervention is that it is

generally a low-cost, enjoyable strategy for dealing with stress and anxiety (29), making it ideal and achievable for resource-poor institutions. Considering that schools across Africa have struggled in the past to fully implement previously recommended CD-related stress interventions like the use of audio-visuals and plastinated models, largely due to inadequate funds, thus, creating the need for simple and cost-effective intervention such as BM would offer.

Background Music Implementation and Recommendations

The use of music has proven to be effective, cheap, safe, and enjoyable the method of managing stress and anxiety. However, It should be noted that while music has been found to have positive effects on different educational settings (30), factors like the music type, volume, as well as individual preferences are important in determining the level of such effect (28).

Available literature suggests that classical and slow tempo music, especially when played at a low volume, produce the most favorable outcome in academic settings (10), while those with higher intensities are generally considered distracting and undesirable. Furthermore, this should be noted that individual music preference, which is an important determinant of musical impact, is influenced by factors such as cultural identification, language, and even religion (31). A recent survey found the use of culturally familiar music to have a strong positive effect on task performance. Therefore, considerable care should be taken when choosing songs to be used in CD classes.

Choosing or selecting a musical genre that accounts for individual musical preferences may pose a potential challenge, as different music

types have been shown to elicit different responses in individuals based on preference (32). Schools should create and restrict music playlist based on student's recommendations, and continuously make an update of the playlist over time to reflect the student's general preference.

The use of BM as a stress-relieving strategy should be strongly encouraged as a way of improving students' CD learning experience and anatomy education in Nigeria and Africa. This should be done alongside previously recommended interventions like the initiation of body donation programs through aggressive campaigns and awareness outreach, as well as making provisions for relevant anatomical teaching aids like audio-visual materials and plastinated models for a more optimal outcome (9).

Conclusion

CD is considered to be the gold-standard for teaching macroscopic anatomy and is essentially indispensable to medical education. However, CD exposes medical students to different kinds of stress associated with the handling of a dead human body especially in African-based institutions where there are many institutions with poorly funded, understaffed, and underequipped laboratories. The use of BM has been proposed as an effective, safe, simple, and cheap intervention to deal with the anxiety, stress, and general difficulties in CD laboratories. This is especially important in Nigeria and Africa where other alternative CD-stress interventions are not obtainable.

Conflict of Interest

The authors have no conflict of interest to declare for the present review article.

Every author contributed equally to all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Reference

1. Pather N. Prosection and Dissection Laboratory Sessions: Design and Implement to Enhance Learning. Teaching Anatomy: Springer International Publishing; 2020. p. 259-69
2. Estai M, Bunt S. Best teaching practices in anatomy education: A critical review. *Annals of Anatomy - Anatomischer Anzeiger*. 2016;208:151-7
3. Sugand K, Abrahams P, Khurana A. The anatomy of anatomy: A review for its modernization. *Anatomical Sciences Education*. 2010
4. Wisenden PA, Budke KJ, Klemetson CJ, Kurtti TR, Patel CM, Schwantz TL, et al. Emotional response of undergraduates to cadaver dissection. *Clinical Anatomy*. 2017;31(2):224-3
5. Lee YH, Lee Y-M, Kwon S, Park S-H. Reactions of First-Year Medical Students to Cadaver Dissection and Their Perception on Learning Methods in Anatomy. *Korean Journal of Medical Education*. 2011;23(4):275-83
6. Boeckers A, Brinkmann A, Jerg-Bretzke L, Lamp C, Traue HC, Boeckers TM. How can we deal with mental distress in the dissection room?—An evaluation of the need for psychological support. *Annals of Anatomy - Anatomischer Anzeiger*. 2010;192(6):366-72
7. Anyanwu EG. Background music in the dissection laboratory: impact on stress associated with the dissection experience. *Advances in Physiology Education*. 2015;39(2):96-101
8. Gbolahan Balogun W. Using Electronic Tools and Resources to Meet the Challenges of Anatomy Education in Sub-Saharan Africa. *Anatomical Sciences Education*. 2018;12(1):97-104
9. Chia T, Oyeniran O. Anatomy Education in Nigeria: Challenges and Prospects. *Journal of Contemporary Medical Education*. 2019;9(3):61
10. Anyanwu GE, Nto JN, Agu AU, Ekezie J, Esom EA. Musical preferences and learning outcome of medical students in cadaver dissection laboratory: A Nigerian survey. *Annals of Anatomy - Anatomischer Anzeiger*. 2016;208:228-33
11. Korf H-W, Wicht H, Snipes RL, Timmermans J-P, Paulsen F, et al. The dissection course – necessary and indispensable for teaching anatomy to medical students. *Annals of Anatomy - Anatomischer Anzeiger*. 2008;190(1):16-22
12. Darras KE, Spouge R, Hatala R, Nicolaou S, Hu J, Worthington A, et al. Integrated virtual and cadaveric dissection laboratories enhance first year medical students' anatomy experience: a pilot study. *BMC Medical Education*. 2019;19(1)

13. Dissabandara LO, Nirthanan SN, Khoo TK, Tedman R. Role of cadaveric dissections in modern medical curricula: a study on student perceptions. *Anatomy & Cell Biology*. 2015;48(3):205
14. Pearson WG, Hoagland TM. Measuring change in professionalism attitudes during the gross anatomy course. *Anatomical Sciences Education*. 2009
15. Simpson JS. An Economical Approach to Teaching Cadaver Anatomy. *The American Biology Teacher*. 2014;76(1):42-6
16. Jacob TG. History of teaching anatomy in India: From ancient to modern times. *Anatomical Sciences Education*. 2013;6(5):351-8
17. Saltarelli AJ, Roseth CJ, Saltarelli WA. Human cadavers Vs. multimedia simulation: A study of student learning in anatomy. *Anatomical Sciences Education*. 2014;7(5):331-9
18. Chia TI, Oyeniran OI, Ajagbe AO, Onigbinde OA, Oraebosi MI. The symptoms and stress experienced by medical students in anatomy dissection halls. *Journal of Taibah University Medical Sciences*. 2020;15(1):8-13
19. Arráez-Aybar L-A, Casado-Morales MI, Castaño-Collado G. Anxiety and dissection of the human cadaver: An unsolvable relationship? *The Anatomical Record Part B: The New Anatomist*. 2004;279B(1):16-23
20. Dempster M, Black A, McCorry N, Wilson D. Appraisal and Consequences of Cadaver Dissection. *Medical Education Online*. 2006;11(1):4592
21. Albabish W, Newton G, Jadeski L. Using a Dissection-based Introductory Laboratory Video to Reduce the Anxiety State of Dissection- and Prosection-based Anatomy Students Prior to their First Cadaver-based Laboratory Experience. 2017;31(S1): 582.25-25
22. Modell HI, DeMiero FG, Rose L. In pursuit of a holistic learning environment: the impact of music in the medical physiology classroom. *Advances in Physiology Education*. 2009;33(1):37-45
23. Gosselin KP, Holland B, Mulcahy A, Williamson S, Widacki A. Music for Anxiety Reduction and Performance Enhancement in Nursing Simulation. *Clinical Simulation in Nursing*. 2016;12(1):16-23
24. Gutiérrez EOF, Camarena VAT. Music therapy in generalized anxiety disorder. *The Arts in Psychotherapy*. 2015;44:19-24
25. Lai H-L, Li Y-M. The effect of music on biochemical markers and self-perceived stress among first-line nurses: a randomized controlled crossover trial. *Journal of Advanced Nursing*. 2011;67(11):2414-24
26. Angel LA, Polzella DJ, Elvers GC. Perceptual and Motor Skills. 2010;110(3C):1059-64
27. Han L, Li JP, Sit JWH, Chung L, Jiao ZY, Ma WG. Effects of music intervention on physiological stress response and anxiety level of mechanically ventilated patients in China: a randomised controlled trial. *Journal of Clinical Nursing*. 2010;19(7-8):978-87
28. Bellier A, Secheresse T, Stoeckle A, Dols AM, Chaffanjon PC. Impact of Background Music on Medical Student Anxiety and Performance During Anatomical Dissections: A Cluster Randomized Interventional Trial. *Anatomical Sciences Education*. 2019;13(4):427-35
29. Kemper KJ, Danhauer SC. Music as Therapy. *Southern Medical Journal*. 2005;98(3):282-8
30. Beck BD, Lund ST, Søgaaard U, Simonsen E, Tellier TC, Cordtz TO, et al. Music therapy versus treatment as usual for refugees diagnosed with posttraumatic stress disorder (PTSD): study protocol for a randomized controlled trial. *Trials*. 2018;19(1)
31. Mohan A, Thomas E. Effect of background music and the cultural preference to music on adolescents' task performance. *International Journal of Adolescence and Youth*. 2019;25(1):562-73
32. Labbé E, Schmidt N, Babin J, Pharr M. Coping with Stress: The Effectiveness of Different Types of Music. *Applied Psychophysiology and Biofeedback*. 2007;32(3-4):163-8

Contact Details

Izuchukwu Azuka Okafor, MD

Department of Anatomy, Faculty of Basic Medical Sciences, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, PMB 5001, Nnewi, Nigeria
E-mail: okaforizuchukwu33@gmail.com
ORCID: 0000-0003-1017-9297

Jude Amechi Nnaka, MD

Department of Anatomy, Faculty of Basic Medical Sciences, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, PMB 5001, Nnewi, Nigeria
E-mail: nnakajude@gmail.com
ORCID:0000-0003-4991-1801

How to cite?

Okafor IA, Nnaka JA. Background Music: The Missing Stress Antidote in Cadaver Dissection Laboratories. *Ulutas Med J*. 2020; 6(4):193-198

DOI: 10.5455/umj.20201004115944