

Educational Article

The symptoms and stress experienced by medical students in anatomy dissection halls



Terkuma I. Chia, M.Sc^a, Oluwatosin I. Oyeniran, M.Sc^{b,*}, Abayomi O. Ajagbe, B.Tech^a, Oluwanisola A. Onigbinde, B.Tech^a and Michael I. Oraebosi, M.Sc^c

^a Department of Anatomy, College of Health Sciences, Nile University of Nigeria, Abuja, Nigeria

^b Department of Physiology, College of Health Sciences, Nile University of Nigeria, Abuja, Nigeria

^c Department of Pharmacology, College of Health Sciences, Nile University of Nigeria, Abuja, Nigeria

Received 26 November 2019; revised 7 January 2020; accepted 7 January 2020; Available online 3 February 2020

المخلص

أهداف البحث: يعد تعرض طلاب الطب لتشريح الجثث تجربة مرهقة مرتبطة بمجموعة من الأعراض. أجريت هذه الدراسة لتحديد الأعراض لطلاب الطب المقبولين حديثاً بعد تعرضهم لأول للجثث في جامعة نيجيرية.

طرق البحث: خلال الأعوام الأكاديمية ٢٠١٨-٢٠١٩ و ٢٠١٩-٢٠٢٠. أجرينا مسحا على ٨٧ طالب طب من السنة الثانية في جامعة النيل النيجيرية. واستخدمت استبانة الأعراض التي تعباً ذاتياً ومقياس تقييم أحداث الحياة لجمع البيانات.

النتائج: كان متوسط الدرجات من مقياس تقييم أحداث الحياة لمجالي التهديد والتحدي للتوتر ٦٣٠ (٢٠.٣٣٪) و ٣٠/١٦ (٥٥.٥٪). وكان متوسط درجة الخسارة ٢٠/٥ (٢٦.١٥٪). عند التعرض للجثة، ذكر معظم الطلاب أنهم شعروا بالفضول والحماس ولكن في نفس الوقت شعروا بالقلق. وظهرت هذه الأعراض على شكل خفقان، وصعوبة في التنفس، وغثيان، وإغماء ودوار. ومن أجل تخفيف هذه الأعراض، ركز معظم الطلاب على مهمة التشريح، أو ممارسة نشاطات دينية، أو الاسترخاء أو طلب المساعدة من المعلمين.

الاستنتاجات: على الرغم من أن التعرض الأول للجثة كان مجهداً، أظهرت نتائجنا أن الطلاب لم يقل عليهم ذلك. رأى الطلاب أنها إيجابية على نطاق واسع وبنلوا جهوداً للتغلب على هذه المشاعر. من غير المرجح أن تشكل المشاعر المجهدة تأثيراً سلبياً على طلاب الطب من خلال دراستهم في قاعة التشريح.

الكلمات المفتاحية: التشريح؛ طلاب الطب؛ الأعراض؛ التوتر

Abstract

Objective: Exposure to the dissection of human cadavers is a stressful experience that causes a wide range of symptoms among medical students. This study examined the symptoms experienced by newly enrolled medical students of a Nigerian university following their first exposure to cadavers.

Methods: During the academic years 2018–2019 and 2019–2020, we conducted a survey among 87 second-year medical students who belonged to the Nile University of Nigeria. A self-administered questionnaire that assessed different symptoms and the Appraisal of Life Events (ALE) Scale were used to collect data.

Results: The participants obtained mean scores of 6 out of 30 (20.33%), 16 out of 30 (55.50%), and 5 out of 20 (26.15%) on the threat, challenge, and loss dimensions of the ALE Scale, respectively. When they were exposed to the cadaver, a majority of the students reportedly felt not only curious and excited but also anxious. Additionally, they reported experiencing symptoms such as palpitations, difficulty breathing, nausea, and feeling faint and dizzy. In order to alleviate such feelings, most of the students focused on the task at hand (i.e. dissection), engaged in religious activities, tried to relax, or sought the help of their lecturers.

Conclusions: Our findings revealed that, even though their first exposure to a cadaver was stressful, the students were resilient. The students appraised this experience positively and had taken efforts to cope with their symptoms. This is unlikely that stressful feelings pose

* Corresponding address: Department of Physiology, College of Health Sciences, Nile University of Nigeria, Abuja, FCT, Nigeria.

E-mail: tosinoyeniran1@gmail.com (O.I. Oyeniran)

Peer review under responsibility of Taibah University.



negative influence on the medical students during their study in anatomy dissection hall.

Keywords: Anatomy; Dissection; Medical students; Stress; Symptoms

© 2020 The Authors.

Production and hosting by Elsevier Ltd on behalf of Taibah University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Any significant change that has the potential to alter the subsequent behaviours or functioning of an individual is a significant life event.¹ One's first close-up exposure to a dead body is widely regarded as a significant life event.² Exposure to a dead body can be regarded as an acute stressor because it is transient in nature.³ Students experience stress when they are confronted with a stressor.⁴ Students are exposed to several stressors, one of which is cadaveric dissection.^{5,6} Such experiences tend to have a negative impact on student learning.^{7,8} Depending on their stress response, the impact can be either positive or negative. Many medical students are exposed to dead bodies for the first time during cadaveric dissection in anatomy dissection halls.^{9–11} The stress that they experience during such events determines their dispositions towards cadaveric dissection. A recent study¹² found that significant life events are related to sleep disturbances, which are known to have a negative effect on academic performance and promote antisocial behaviours.

According to the transactional theory of stress and coping (TTSC),¹³ stress is a by-product of interactions between individuals and their immediate surroundings or environments. Their responses to a stressor are determined by their perceptions of the respective event.¹⁴ Within the framework of the TTSC, there are three levels of stress appraisal: primary, secondary, and re-appraisals. Primary appraisals are appraisals of whether a stressor is threatening. Secondary appraisals entail an assessment of the resources that are available to cope with a stressor. Re-appraisal involves continuous appraisals of a specific stressor and available resources. When faced with a stressful event, an individual will adopt either problem- or emotion-focused coping strategies, depending on their secondary appraisals of a stressor.¹³ Individuals use problem- and emotion-focused coping strategies when the resources that they require to cope with a stressor are perceived to be sufficient and insufficient, respectively.¹³

In Nigeria, the first-year medical curriculum covers primarily the general sciences (e.g. biology, chemistry, and physics), whereas the second- and third-year curricula cover the basic medical sciences (e.g. anatomy, physiology, and biochemistry). The two notable methods that are used in the study of anatomy are didactic lectures and cadaveric dissection.^{15,16} There is evidence to suggest that the symptoms of post-traumatic stress disorder (PTSD) are exacerbated by exposure to human cadavers in anatomy dissection halls.¹⁷ Long-term participation in an anatomy

dissection course has been found to increase the prevalence of the symptoms that are indicative of PTSD among medical students.¹⁷ The prevalence of stress, and possibly, PTSD, that is attributable to cadaveric dissection ranges from 8% to 9%.¹⁸ Students who dissect human cadavers experience negative emotional reactions (e.g. depression, fear), palpitation, insomnia, a loss of appetite, and visual images of cadavers.^{19,20} More importantly, stress and anxiety are related to general memory and learning deficits.^{21,22} Therefore, further exposure to stressful events may increase their risk of academic failure and dropping out of medical school.

The Nile University of Nigeria in Abuja recently established a medical school. Accordingly, we conducted this study to examine (1) the symptoms experienced by young medical students following their first exposure to cadavers in an anatomy dissection hall and (2) how they handle the resultant stress. The findings are expected to have important implications for successful medical training because negative perceptions of events can result in detachment.⁶

Materials and Methods

This descriptive cross-sectional study was conducted among the medical students of the Nile University of Nigeria in Abuja. The study population was 100 second-year (Year II) medical students (2018–2019 academic session: $n = 50$, 2019–2020 academic session: $n = 50$). Convenience sampling was used, and second-year students who were willing to participate in the study were included in the sample. Data were collected from the two samples in November 2018 and 2019, respectively. Getachew²³ has developed a reliable and valid measure of dissection hall experiences, and this assessment was used in this study. It was pre-tested and validated as a part of this study.

On the day on which they were first present in the anatomy dissection hall, the students were provided with the measurement instruments. The questionnaire consisted of three parts: demographic data, symptomology (i.e. a modified version of Getachew's²³ assessment), and the Appraisal of Life Events (ALE) Scale, which assesses the dimensions of threat, challenge, and loss.²⁴ The 16 items of the ALE scale assess threat (items: 1, 2, 4, 5, 14, and 15; maximum possible score: 30), challenge (items: 3, 6, 7, 8, 12, and 13; maximum possible score: 30), and loss (items: 9, 10, 11, and 16; maximum possible score: 20). Threat and loss are considered to be negative appraisals, whereas challenge is considered to be a positive appraisal. Responses are recorded on a six-point Likert scale that ranges from 0 to 5. Students provided informed consent after they were informed about the study and its purpose. Subsequently, they completed and returned the measurement instruments. To analyse the data, ranges, means, and percentages were computed using Microsoft Excel 2010 for Windows. The results are presented in tables and illustrated using bar charts.

Results

During the 2018–2019 academic session, 40 (80.00%) out of the 50 second-year medical students consented and

Table 1: Descriptive statistics for scores on the Appraisal of Life Events Scale.

Dimension	Maximum possible score	(N = 87)			
		Mean	Percentage (%)	Minimum	Maximum
Threat	30	6.10	20.33	0	24
Challenge	30	16.65	55.50	3	25
Loss	20	5.23	26.15	0	19

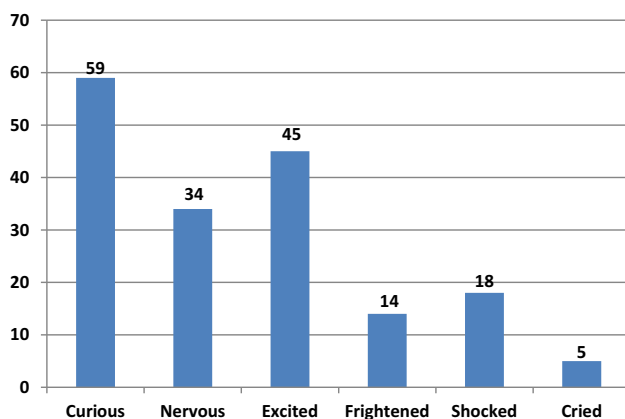
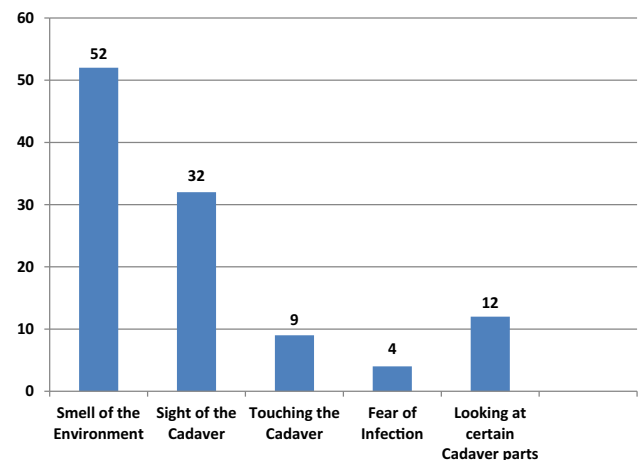
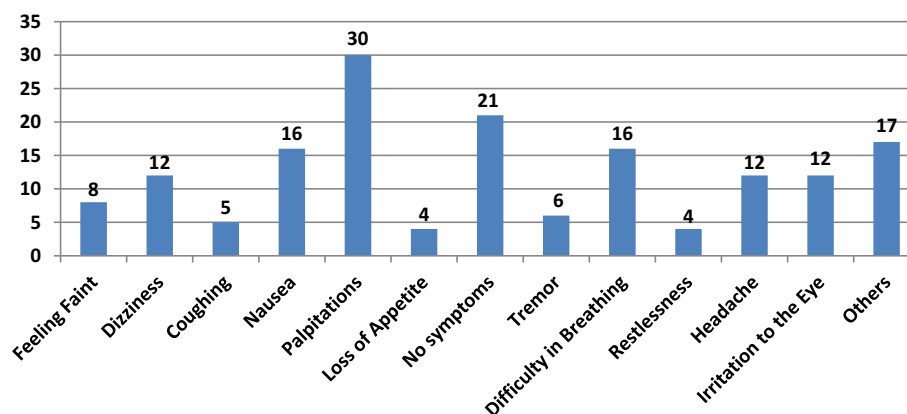
participated in this study. During the 2019–2020 academic session, 47 (94.00%) out of the 50 second-year medical students consented and participated in the study. Therefore, the overall response rate was 87.00% ($n = 87$). The sample consisted of 14 (16.09%) men and 73 (83.91%) women. The mean age of the participants was 18.10 years (range: 15–26 years).

Descriptive statistics for the scores that the participants obtained on the ALE scale are presented in Table 1. They obtained a mean score of 6.1 (20.33%) out of 30, 16.65 (55.50%) out of 30, and 5.23 (26.15%) out of 20 on the threat, challenge, and loss dimensions, respectively. Their scores on the threat, challenge, and loss dimensions ranged from 0 to 24, 3 to 25, and 0 to 19, respectively.

Specifically, 59 and 45 of them reported feeling curious and excited, respectively. However, 18 and 14 of them

reported feeling shocked and frightened, respectively. Additionally, 5 participants reported that they cried (Figure 1).

Figure 2 presents the symptoms that the participants had experienced when they were present in the anatomy dissection hall. Out of the 87 participants, 30 of them reported experiencing palpitations, 16 of them had difficulty breathing, and 16 of them felt nauseated. Further, 12 students reported experiencing dizziness, a headache, and eye irritation. Seventeen students experienced ‘other’ symptoms, and 21 of them did not experience any symptoms when they were present in the dissection hall. With regard to the other symptoms, 8, 6, and 5 participants reported feeling faint, experiencing

**Figure 1:** Students' emotional responses following their first exposure to cadavers.**Figure 3:** Possible causes of the symptoms experienced by students following exposure to the cadaver.**Figure 2:** Symptoms experienced by students following their entry into the anatomy dissection hall for the first time.

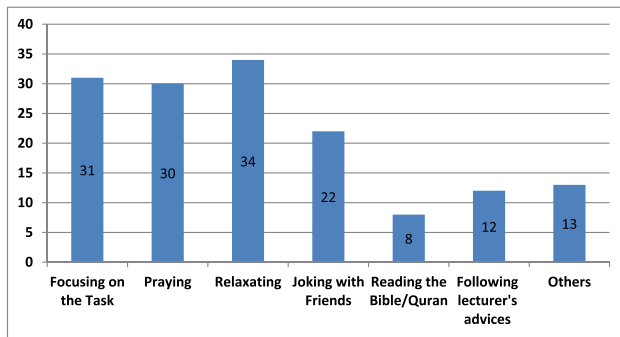


Figure 4: Strategies used by the students to cope after the experience.

tremors, and coughing, respectively. Restlessness and a loss of appetite were reported by 4 participants each.

With regard to the possible causes of the symptoms that were experienced by the participants, it can be inferred from Figure 3 that a majority of them ($n = 52$) reported that their symptoms were caused by the smell of the environment. The sight of the cadaver was the second most commonly reported trigger ($n = 32$). Twelve students reported that looking at certain parts of the cadaver triggered their symptoms. Only a few students reported that their symptoms were triggered by their exposure to a cadaver ($n = 9$) and a fear of infection ($n = 4$).

In response to the question that assessed the strategies that they had used to cope with the symptoms triggered by their exposure to a cadaver (Figure 4), most of the participants reported that they had tried to relax ($n = 34$), focus on the task at hand ($n = 31$), or pray ($n = 30$). Others socialised with their friends by means of joking ($n = 22$), whereas others sought the advice or counsel of their lecturers ($n = 12$). A few students ($n = 8$) read the scriptures of their respective faiths. Moreover, 13 ($n = 13$) students engaged in 'other' activities.

Discussion

Everyone faces stressful events as a part of their daily lives, but medical students experience higher levels of stress, which are attributable to specific aspects of their training that the general population is not exposed to.^{25–27} Similar to the findings of past studies that have been conducted using different student samples, first-time exposure to a cadaver was found to be a stressor.^{28,29} In a past study,²³ many students had reported that they had experienced a loss of appetite and fear and could smell the odours in the dissection hall. In one study, which was conducted among the students of the University of Jos in Nigeria, the most commonly reported concerns were a fear of infection and dizziness.³⁰ In another study that was conducted in Australia, the smell of the dissection hall was identified as a factor that caused students to avoid attending dissection sessions.³¹

Similar to past findings, the smell of the dissection hall was the most commonly reported trigger of the symptoms that were experienced by students. Therefore, it is necessary to ensure that dissection halls are adequately ventilated to

mitigate the negative effects of such odours. Similar to past findings, several participants reported feeling faint and experiencing palpitations, dizziness, eye irritation, and difficulty breathing. This is attributable to the fact that the chemical that is most commonly used to preserve cadavers, namely, formaldehyde, is known to cause adverse symptoms, especially in those with allergies.^{32,33}

Most of the participants perceived this experience to be a challenge, which is a positive appraisal. This finding concurs with those of past studies.^{4,29,34,35} Since their overall perception of this experience was positive, it is unlikely that students will avoid attending dissection sessions. Their positive appraisals of these experiences may be accounted for by an explanation that has been offered by Schwarzer and Schulz³⁶: anticipated events cause more stress than unanticipated ones do. Though exposure to cadavers is stressful, past studies have shown that students adapt to such experiences rather quickly (i.e. within a few weeks).^{4,34} However, due attention should be paid to the few students who appraise this experience negatively. To ensure that such experiences do not adversely affect their academic progress, strategies that can effectively address their concerns should be adopted. This is particularly important in countries (e.g. Nigeria) where cadaveric dissection is a strategy that is commonly employed in the study of anatomy. As past studies have shown, failure to address the concerns of such students will render them very vulnerable to psychological morbidities.²⁶

Consistent with past findings, most of our participants adopted problem-focused coping strategies to deal with their stressful experiences.^{36,37} Most students perceived the event as a challenge; accordingly, instead of avoiding dissection, they focused on the task at hand, as evidenced by their reports that they were curious and felt excited. They were able to cope with their challenging experiences by socialising with their classmates, talking to their lecturers, and engaging in religious rituals (e.g. reading the scriptures of their respective faiths). A study that was conducted in 1995³⁸ found that spirituality is an important factor that helps individuals cope with stressful events, and this finding is consistent with our own results.

In general, students consider cadaveric dissection to be exciting and integral to their learning. However, it is important for them to be adequately prepared for the emotional ramifications of such an exercise before they commence dissection.^{39,40} A recent study⁴¹ found that playing background music in the dissection hall is effective in ameliorating some of the symptoms that are experienced by students. Adopting such strategies will not only make the dissection hall less repulsive but also enhance the extent to which students benefit from dissection sessions.

Conclusion

Going by our finding, even though their first exposure to a cadaver was stressful, our participants appraised this experience positively and tried to cope with the resultant symptoms. Thus, the stress that is caused by exposure to cadaveric dissection is unlikely to have a negative effect on student learning in anatomy dissection halls. Due attention should be

paid to the few students who appraise this experience negatively. Their concerns about the environment of the dissection hall should be addressed to make the laboratory more student-friendly and conducive to learning. In addition, teachers should adequately prepare their students for cadaveric dissection by informing them about what they should anticipate, and equipping them with strategies that they can use to cope with any resultant negative experiences. Such strategies may enhance the extent to which cadaveric dissection is meaningful and beneficial to their learning process.

Source of funding

This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

There is no conflict of interest.

Ethical approval

Ethical approval to conduct this study was obtained from the Ethical Review Board of the Nile University of Nigeria in Abuja. This study was conducted in accordance with the Declaration of Helsinki.

Consent

The participants were informed about the aim of the study, and they provided informed consent prior to participation.

Authors contributions

TC and OIO conceived and designed the study. AOA and OO conducted the study and identified suitable research instruments. MIO collected and organised the data. All the authors analysed the data and interpreted the results. All the authors wrote the initial and final drafts of the article and provided logistic support (where necessary). All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Acknowledgment

The authors thank the management of the Nile University of Nigeria in Abuja for permitting us to conduct this study.

References

- Banyard VL, Cantor EN. Adjustment to college among trauma survivors: an explanatory study of resilience. *J Coll Student Dev* 2004; 45(2): 207–221.
- O'carroll RE, Whiten S, Jackson D, Sinclair DW. Assessing the emotional impact of cadaver dissection on medical students. *Med Educ* 2002; 36(6): 550–554.
- Cohen S, Janicki-Deverts D, Miller GE. Psychological stress and disease. *J Am Med Assoc* 2007; 298(14): 1685–1687.
- Dempster M, Black A, McCorry N, Wilson D. Appraisal and consequences of cadaver dissection. *Med Educ Online* 2006; 11(1): 4592.
- Lindsey R, Reed S, Lyons R, Hendricks D, Mead A, Butler KL. Sources of stress among gender and classification for African American college students. *Coll Student J* 2011; 45(4): 749–758.
- Tseng WT, Lin YP. “Detached concern” of medical students in a cadaver dissection course: a phenomenological study. *Anat Sci Educ* 2016; 9(3): 265–271.
- Rowe A, Fitness J. Understanding the role of negative emotions in adult learning and achievement: a social functional perspective. *Behav Sci* 2018; 8(2): 27.
- Tyng CM, Amin HU, Saad MN, Malik AS. The influences of emotion on learning and memory. *Front Psychol* 2017; 8: 1454.
- Houwink AP, Kurup AN, Kollars JP, Kraikollars CA, Carmichael SW, Pawlina W. Help of third year medical students decreases first-year medical students' negative psychological reactions on the first day of gross anatomy dissection. *Clin Anat* 2004; 17(4): 328–333.
- Böckers A, Baader C, Fassnacht UK, Öchsler W, Böckers TM. Reduction of mental distress in the dissection course by introducing the body donor experience through anatomical demonstrations of organ systems. *Anat Sci Educ* 2012; 5(6): 321–329.
- Anyanwu GE, Obikili EN, Agu AU. The dissection room experience: a factor in the choice of organ and whole body donation-A Nigerian survey. *Anat Sci Educ* 2014; 7(1): 56–63.
- Li Y, Gu S, Wang Z, Li H, Xu X, Zhu H, Deng S, Ma X, Feng G, Wang F, Huang JH. Relationship between stressful life events and sleep quality: rumination as a mediator and resilience as a moderator. *Front Psychiatr* 2019; 10: 348.
- Lazarus RS, Folkman S. *Stress, appraisal, and coping*. Springer publishing company; 1984.
- Updegraff JA, Taylor SE. From vulnerability to growth: positive and negative effects of stressful life events. *Loss Trauma: Gen Close Relat Perspect* 2000; 25: 3–28.
- Akinola OB. Formal body bequest program in Nigerian medical schools: when do we start? *Anat Sci Educ* 2011; 4(4): 239–242.
- Chia T, Oyeniran OI. Anatomy education in Nigeria: challenges and prospects. *J Contemp Med Educ* 2019; 9(3): 61–65.
- Finkelstein P, Mathers LH. Post-traumatic stress among medical students in the anatomy dissection laboratory. *Clin Anat* 1990; 3(3): 219–226.
- Elhai JD, Miller ME, Ford JD, Biehn TL, Palmieri PA, Frueh BC. Posttraumatic stress disorder in DSM-5: estimates of prevalence and symptom structure in a nonclinical sample of college students. *J Anxiety Disord* 2012; 26(1): 58–64.
- Dempster M, Black A, McCorry N, Wilson D. Appraisal and consequences of cadaver dissection. *Med Educ Online* 2006; 11(16): 1–9.
- Bob MH, Popescu CA, Armean MS, Suci SM, Buzoianu AD. Ethical views, attitudes and reactions of Romanian medical students to the dissecting room. *Rev Med-Chir Soc Med Nat Iasi* 2014; 118(4): 1078–1085.
- Mancevska S, Pluncevic-Gligoroska J, Dejanova B, Petrovska S, Bozinovska L. Attention and learning in medical students with high anxiety. *Neurosci Lett* 2011; 500: e46–e47.
- Schwartz SM, Evans C, Agur AMR. Comparison of physical therapy anatomy performance and anxiety scores in timed and untimed practical tests. *Anat Sci Educ* 2015; 8(6): 518–524.
- Getachew D. Reaction of medical students to experiences in dissection room. *Ethiop J Health Sci* 2014; 24(4): 337–342.
- Ferguson E, Matthews G, Cox T. The appraisal of life events (ALE) scale: reliability and validity. *Br J Health Psychol* 1999; 4(2): 97–116.
- Naidoo SS, Van Wyk J, Higgins-Opitz SB, Moodley K. An evaluation of stress in medical students at a South African university. *S Afr Fam Pract* 2014; 56(5): 258–262.

26. Koochaki GM, Charkazi A, Hasanzadeh A, Saedani M, Qorbani M, Marjani A. Prevalence of stress among Iranian medical students: a questionnaire survey. **East Mediterr Health J** 2011; 17(7): 593–598.
27. Sherina MS, Rampal L, Kaneson N. Psychological stress among undergraduate medical students. **Med J Malaysia** 2004; 59(2): 207–211.
28. Dinsmore CE, Daugherty S, Zeitz HJ. Student responses to the gross anatomy laboratory in a medical curriculum. **Clin Anat** 2001; 14(3): 231–236.
29. Mc Garvey MA, Farrell T, Conroy RM, Kandiah S, Monkhouse WS. Dissection: a positive experience. **Clin Anat** 2001; 14(3): 227–230.
30. Shugaba AI, Usman YM, Shimwen FJ, Uzokwe CB, Shinku F, Rabi AM, Hassan ZI. Attitude of Jos University medical students to their initial encounter with cadavers in the dissecting room. **J Exp Clin Anat** 2015; 14(2): 101–104.
31. Dissabandara LO, Nirthanan SN, Khoo TK, Tedman R. Role of cadaveric dissections in modern medical curricula: a study on student perceptions. **Anat Cell Biol** 2015; 48(3): 205–212.
32. Pietrzyk L, Torres A, Denisow-Pietrzyk M, Maciejewski R, Torres K. Formaldehyde-related clinical symptoms reported by medical students during gross anatomy cadaver dissection. **Przegląd Dermatol** 2016; 103(4): 273–280.
33. Elshaer NS, Mahmoud MA. Toxic effects of formalin-treated cadaver on medical students, staff members, and workers in the Alexandria Faculty of Medicine. **Alexandria J Med** 2017; 53(4): 337–343.
34. Karau PB, Wamachi A, Ndede K, Mwamisi J, Ongeti K. Physical and emotional impact of dissection: findings from a pioneer medical class in a Kenyan Medical School. **Anat J Afr** 2016; 5(2): 721–726.
35. Alhassan A, Majeed S. Perception of Ghanaian medical students of cadaveric dissection in a problem-based learning curriculum. **Anat Res Int** 2018; 2018.
36. Schwarzer R, Schulz U. *The role of stressful life events. Comprehensive handbook of psychology*; 2002.
37. Sándor I, Birkás E, Györfy Z. The effects of dissection-room experiences and related coping strategies among Hungarian medical students. **BMC Med Educ** 2015; 15(1): 73.
38. Paloutzian RF, Kirkpatrick LA. Introduction: the scope of religious influences on personal and societal well-being. **J Soc Issues** 1995; 51(2): 1–11.
39. Javadnia F, Hashemitabar M, Kalantarmahdavi SR, Khajehmoghahi N. How to decrease the emotional impact of cadaver dissection in medical students. **Pak J Med Sci** 2006; 22(2): 200–203.
40. Cody JA. *The roles of stress appraisal and self-efficacy in fostering resilience to improve psychosocial outcomes following negative life events among college students: a multiple mediation analysis*. Unpublished PhD Dissertation. USA: University of Tennessee; 2013.
41. Anyanwu EG. Background music in the dissection laboratory: impact on stress associated with the dissection experience. **Adv Physiol Educ** 2015; 39(2): 96–101.

How to cite this article: Chia TI, Oyeniran OI, Ajagbe AO, Onigbinde OA, Oraebosi MI. The symptoms and stress experienced by medical students in anatomy dissection halls. *J Taibah Univ Med Sc* 2020;15(1):8–13.