

PHYSICAL AND EMOTIONAL IMPACT OF CADAVER DISSECTION: FINDINGS FROM A PIONEER CLASS IN A KENYAN MEDICAL SCHOOL

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Abbreviated title: Physical and emotional impact of cadaver dissection

ABSTRACT

Cadaver dissection is a significant life experience, and constitutes a potential stressor in medical education, with attendant physical and psychological effects. However, these effects have mostly been studied in established medical schools. We sought to determine the physical and emotional impact of cadaver dissection among medical students in a pioneer class. We administered two questionnaires: one on the first day of dissection, and the second six weeks later. Each examined the symptoms of cadaver exposure, and the emotional impact using the Appraisal of Life Events (ALE) scale, which measures the scores for *challenge*, *threat* and *loss*. The commonest symptoms reported were nausea, fear (with palpitations) and restlessness. Female students reported more symptoms compared to male students. Most symptoms reduced significantly after six weeks. In conclusion, we found that the dissection experience is challenging and stimulating to most students, as evidenced by higher ALE scores for challenge factor compared to threat and loss. We conclude that dissection, though physically exerting to students, is not considered an aversive experience. The gender differences underlie the need for gender-tailored pre-dissection preparation and counselling.

Keywords: Cadaver, Dissection, Symptoms, Psychological, Appraisal of Life Events.

INTRODUCTION

The first encounter with a cadaver is a vivid experience for many medical students, and is widely regarded as the proper initiation into the medical fraternity. Here, they confront aspects of their own humanity, and this may have an influence on how they handle live patients later in their medical careers.

Physical and psychological adverse effects of cadaver dissection have been documented, in up to 30% of medical students (Horne et al., 1990). Initial exposure to cadaver dissection can be a significant emotional experience by some young medical

students. Some have been reported to exhibit anxiety, depression and sleep disturbances, but the majority adapt to the situation quickly (O' Carroll et al., 2002). Dizziness, nausea, weakness and restlessness are some of the reported physical consequences of cadaver exposure.

A new medical school might not possess the benefit of cohorts of older medical students to initiate the young entrants into the formidable discipline of human anatomy. The reactions of pioneer medical students are not documented in the literature.

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Appraisal of Life Events (ALE) is a reliable tool to psychometrically measure the impact of emotionally charged experiences by taking into account positive as well as negative emotional appraisals of significant life events (Ferguson et al.,

1999). The MBChB Programme in this newly established medical school uses an integrated approach to teach basic sciences, and was started in May 2012. This study was carried among 78 pioneer students of the programme.

MATERIALS AND METHODS

This was a descriptive cross-sectional, questionnaire-based study, conducted in the department of Human Anatomy, School of Medicine and Health Sciences, in a young University. The Bachelor of Medicine and Bachelor of Surgery programme was introduced in 2012. This study was conducted among a pioneer cohort of 78 students undertaking Human Anatomy course towards attainment of Bachelor of Medicine and Bachelor of Surgery degree.

All consenting students filled the questionnaire on the first day of dissection, and six weeks later. The questionnaire had three sections; sociodemographic information, a second part on symptomatology with yes and no questions, and Appraisal of Life Events

scale with 16 Likert-type questions (six point scales where 0= not at all, 5=very much so, to indicate the extent to which each of the adjectives best described their perceptions of the event when it occurred). All consenting students on the first day of dissection agreed to participate six weeks later. The objectives of the study were explained to the students.

Data was entered into Epi-info version 7 for analysis. Descriptive statistics like means and frequencies were used to analyze the variables. The Wilcoxon sign-rank test was used to compare the symptoms and ALE scores on the first cadaver encounter and 6 weeks later. Data was presented using tables and histograms.

RESULTS

Out of a total of 78 students, 75 (96.2%) completed the questionnaires. The mean age was 20.2 +/-1.6 years. There were 36 male students (48%) and 39 female students (52%).

Symptomatology

The commonest symptoms on initial visit to the dissection room were nausea (n=20, 26.7%), fear with palpitations (n=20, 26.7%) and restlessness (n=18, 24%). After six weeks of dissection, the commonest reported symptoms were weakness (n=8, 10.7%) and despair (n=7, 9.3%). There was a significant reduction in symptoms after six weeks of cadaver exposure, with the 41 reports of symptoms compared to 107 on initial cadaver exposure (p=0.002).

We found that students who had prior exposure to a dead body (either having done a clinical course before enrolling for MBChB degree, or had been exposed to a cadaver) had significantly less symptoms on the first day of dissection compared to those with no prior exposure (p= 0.004).

Overall, female students reported more symptoms than male students (73 vs 34, p =0.01, initial

encounter and 24 vs 15 complaints, p= 0.08, after six weeks). Only male students reported nightmares, and more male students reported lack of concentration compared to females. Histogram 1 illustrates the combined initial and six week symptoms between male and female students.

Changes in symptoms over time in both male and female students

There was a significant reduction in symptoms in both males and females. There were 15 reported symptoms among male students six weeks later, compared to 34 on initial dissection (p= 0.04), while 24 female students reported symptoms 6 weeks later compared to 73 on initial dissection (p= 0.02). Generally, all symptoms reduced across the six week period, except despair among males, which rose from 0 to 5 reports and lack of concentration among females which rose from 1 report to 4 reports six weeks later. Line graphs 1 and 2 below illustrate the changes in symptoms among male and female respondents from the initial period to six weeks later.

Histogram 1 comparing overall symptoms between males and female medical students.

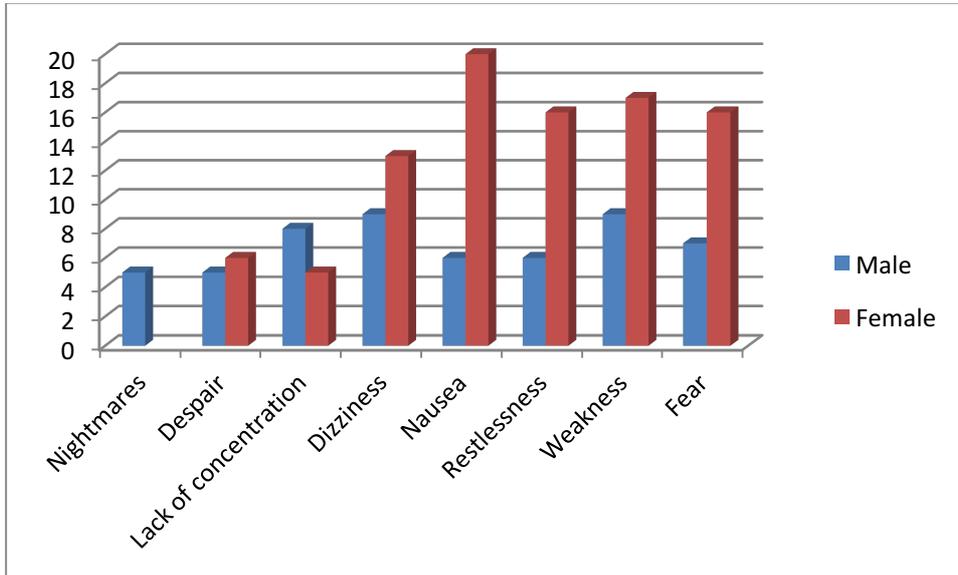


Figure 1: A Line graph showing the longitudinal change in symptoms among male students from the initial dissection experience to 6 weeks

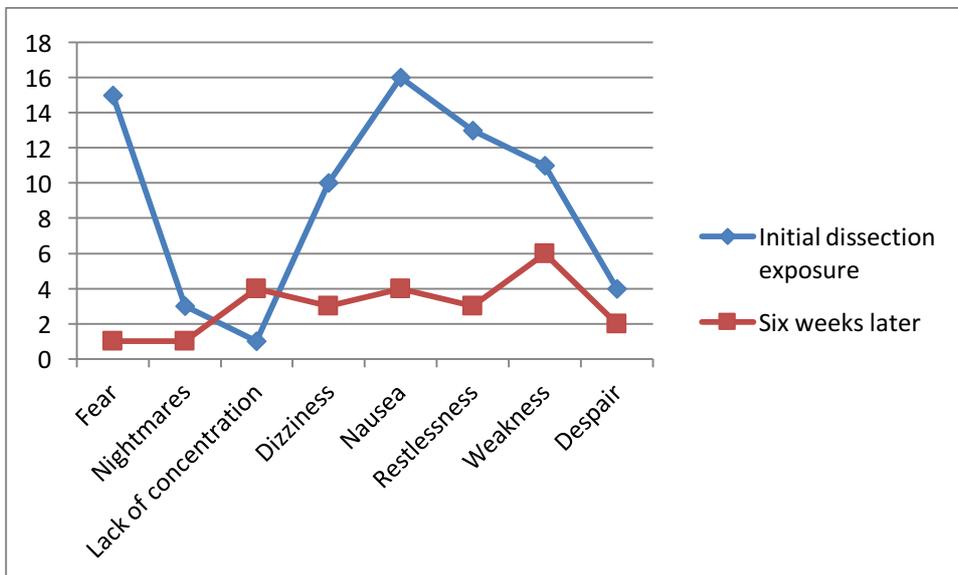
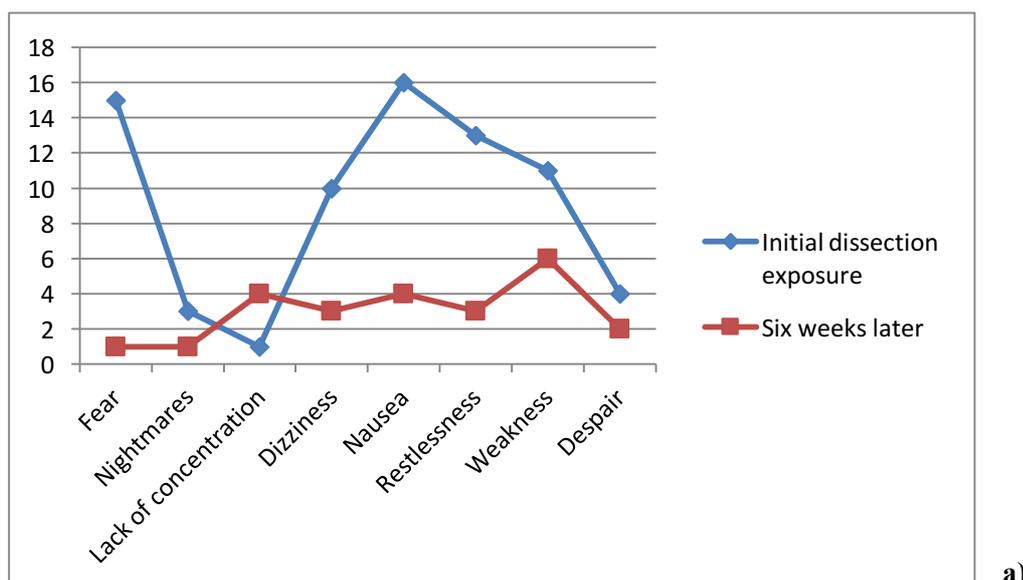


Figure 2: A line graph showing the longitudinal change in symptoms among female students from the initial dissection experience to 6 weeks

Appraisal of Life Events Scores

Challenge factor had the highest mean on initial cadaver exposure. All the scores decreased over the

six weeks of dissection, although none of the reduction was statistically significant. The ALE scores on initial cadaver exposure and six weeks later are as shown in *table I*.



a)

Table I showing ALE scores on initial cadaver exposure and six weeks later.

ALE FACTOR	Mean	Range	Maximum possible score
Initial challenge	15.2	1-20	30
Initial Threat	8.8	0-25	30
Initial loss	2.6	0-16	20
Challenge 6 weeks later	12.8	0-15	30
Threat 6 weeks later	8.1	0-20	30
Loss 6 weeks later	2.2	0-16	20

DISCUSSION

Our study revealed a high incidence of nausea (26.7%), fear accompanied with palpitations (26.7%) and restlessness (24%) as the commonest symptoms reported by students on initial exposure to cadaver dissection. This supports the findings of other researchers who have reported high incidence of nausea, fear, restlessness and dizziness among medical students exposed to cadavers on the first day of dissection (Mc Garvey et al., 2001, Abay et al., 2012). In a sample of 68 Iranian students, Fatemeh et al (2006) reported 38.7% of students with lack of concentration, 29% of nausea, and 32% of fear on initial dissection. Although these figures are higher than our findings, they support our assertion that nausea and fear are common symptoms experienced by students on initiation to dissection. Formalin exposure and the intimidating environment of the contemporary dissection laboratory have been blamed for the symptomatology (Khan et al., 2013).

There is an emerging debate on the feasibility and safety of cadaver dissection in light of the physical effects of formalin exposure. However, most anatomists agree that dissection is the most universal and universally recognizable step in becoming a doctor (McLachlan et al., 2004).

Female students reported more symptoms compared to male students. We have found very few studies in the existing literature comparing the physical symptoms of cadaver dissection between male and female gender students. A Nigerian study found that female students are more susceptible to stressor and physical effects of exposure to cadavers compared to their male counterparts (Ajao et al., 2008). This was corroborated by the findings of Nnodim (1998). This shows the importance of tailoring mental preparation pre-dissection counselling to gender, because of the obvious gender-specific needs. We found higher levels of

lack of concentration in males compared to females, perhaps suggesting that females take their work more keenly. Emerging trends in Kenya are pointing to more females enrolling for medical education compared to males.

We found a significant reduction in overall symptomatology over time, except for despair which increased in males from 0% on initial cadaver encounter to 6.7% six weeks later. Among females, lack of concentration was found to increase marginally over time. Our findings are in agreement with several other studies. An Indian study found that nausea, fear and other symptoms decreased significantly over time (Arora et al., 2011). In a sample of Ethiopian students, fear reduced from 58.5% on initial exposure to 12.2% on second exposure one week later (Abay et al., 2012). Mc Garvey et al (2001) reported a significant reduction in nausea, dizziness and fainting from initial dissection room exposure and ten weeks later. These findings may be attributable to increased interest and familiarization with dissection. Abay et al (2012) found that excitement and passion for dissection increase from the initial exposure to subsequent exposures. The finding of increase in despair among male students in our sample might be explained by the fact that some students start medical school without fully deciding their careers, and give up in the process when they are exposed to dissection.

Our findings suggest that students perceive cadaver dissection as a positive experience, as evidenced by high *challenge* scores, compared to *threat* and *loss*. This agrees with findings of other authors, that students take the dissection experience positively, and find it stimulating and exciting (Vijayabhaskar et al., 2005, Dempster et al., 2006). O'Carroll et al (2002) found challenge scores of 16.6, threat 6.7 and loss 2.8, a trend which agrees with our findings

on initial encounter and six weeks later. We found that all the ALE scores decreased after six weeks, in almost a similar manner to physical symptoms, suggesting that students get used to the dissection experience over time. It has been postulated that students who undertake courses like anatomy do so because they perceive cadaver dissection as thrilling and challenging (McGarvey et al., 2001, O'Carroll et al., 2002). Assistance from senior medical students is a recognized means of reducing stress in some institutions (Vijayabhaskar et al., 2005). Horne et al found that the most reported coping mechanism for dissection experience was discussion with fellow students, with only 3 out of 100 students discussing their reactions with faculty staff members. This shows the importance of peer mentorship. However, in our case, this being a pioneer class, such experience is not possible. Faculty members and the counselling department must thus step in to fill this gap.

Conclusion

This study adds voice to previous studies, which have found that the dissection experience is a significant life event, with attendant physical and psychological reactions by students. Being among the few studies done in a new medical school, it sheds light on the afflictions and challenges of students encountering dissection for the first time. Female students are more afflicted with physical symptoms after cadaver exposure, meaning that counselling and mental preparation before dissection should be tailored to specific genders. Continual exposure to dissection has been found to diminish the physical symptoms of cadaver exposure. The finding of high challenge scores in the ALE scale means that many students rate cadaver dissection positively, and see it as a challenge they must surmount to become medical doctors.

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