Winning Hearts and Minds: Inspiring Medical Students into Cardiothoracic Surgery Through Highly Interactive Workshops

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BACKGROUND: The cardiothoracic surgical (CTS) specialty has witnessed a decline in the applicant pool. Early exposure, positive experiences, inspiring role models, and career insight are key in the decisionmaking process for specialty choice. Our objective was to assess the effect of high tutor:student ratio interactive CTS workshops in influencing the career choice of UK undergraduate medical students.

METHODS: Medical students attended a workshop comprising (1) guided dissection of fresh animal hearts, (2) surgical skills practice on models and fresh hearts, (3) operative videos (adult, congenital, transplant, and aortic) with interactive commentary, and (4) careers seminar. The tutor:student ratio was very high (between 31 and 51). A questionnaire was completed at the end of each workshop to assess its effect, including a 10-point Likert scale on the perceived attraction to CTS before and after the workshop.

RESULTS: A total of 96 delegates attended 5 workshops in 3 UK medical schools. Response rate was 83% from 80 undergraduate students. In all, 58% were male (46/80). There was an equal proportion of sexes in the early years of medical school, but was significantly skewed toward male in the later years. There was a statistically significant increase of 2.1 (standard deviation [SD] = 1.5) in the Likert scores before ($\mu = 5.0$, SD = 2.1) and after ($\mu = 7.1$, SD = 1.9) ($p = 0.001$). This represents a 42% increase in the perceived attraction to the CTS specialty because of the workshops.

CONCLUSIONS: Our workshops have a significant effect in stimulating undergraduate medical students toward a career in cardiothoracic surgery. We encourage national takeup of these easily organized daylong workshops to foster interest in the next generation of cardiothoracic surgeons. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: recruitment, career choice, surgical training, thoracic surgery

COMPETENCIES: Practice-Based Learning, Interpersonal and Communication Skills

INTRODUCTION

There has been a tidal change in recruitment to cardiothoracic surgery (CTS) with declining applicant numbers in the United States,[1,2] the United Kingdom,[3] and further afield.[4] A shortage in the workforce has been predicted on both sides of the Atlantic.[5-7] A large cohort study of UK graduates reported that 90% of eventual surgeons (of any specialty) had been set on the path in their first-year postqualification. However, only 15.8% who stated their intention to become cardiothoracic surgeons eventually trained in the specialty.[8] This unpopularity among junior surgical trainees has been reflected in more recent surveys.[9]

The decline in popularity of CTS has been recognized and steps taken to counter the trend. Where recruitment used to be superspecialization after general surgical training, the United States (since 2007) and the United Kingdom (since 2013) have implemented "integrated" or "run-through" training to attract prospective applicants immediately following medical school or foundation training. This has provided a form of job security and availability through training completion, one of the principal perceived shortcomings in a survey of residents.[1] Comprehensive programmes that provide medical students mentorship, clinical shadowing,

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research opportunities, and exposure to simulation in CTS have shown to increase interest in the specialty.[10-12]

Our objective was to assess the effect of high tutor: student ratio interactive CTS workshops in influencing the career choice of UK undergraduate medical students.

MATERIALS AND METHODS

Workshop Design

CTS daylong workshops were organized by surgeons and students from the local university surgical society. Medical students were invited through social media, mailing lists, and posters. Multiple workshops were conducted between April 2014 and February 2015 at 3 medical schools.

The session began with an introduction to the specialty by way of stories and videos of clinical experiences, patient's stories, and trivia.

Following this, students' groups of 2 to 5 were paired with surgeons who guided them through fresh animal dissection. Each student had at least a heart (porcine or ovine) or the "pluck" where possible (heart, lungs, and descending aorta). Exploration of the anatomical relations, and insights into the structure-function relationship were encouraged. For example, assessing the competency of atrioventricular valves by water injection, or dissecting the coronary vessels within the interchamber grooves. Atriotomies and ventriculotomies were performed to examine the innards of all the chambers. This was also an exercise in the fundamentals of tissue handling using forceps, scissors, and scalpel.

Students remained in their groups following dissection. Groups were stratified by surgical skill level in suturing and knot-tying. Novices were taught one-handed knot-tying and simple interrupted suturing using the tripod grip. Advanced students were given feedback on the nuances of their basic techniques such as economy of movement and ergonomics. Further skills such as palm grip, continuous suturing, and anastomosis were taught according to skill level.

The fourth part of the workshop was commentaries of operative videos recorded with consent at the hospital, or publicly available. This part served to consolidate the introductory clinical material, and practical stations in anatomy and surgical skills, as the students gained an insight into the application of anatomy, physiology, and surgical skills in surgery. Coronary artery bypass grafting, ascending aortic aneurysm repair, congenital repairs, and cardiac transplantation were some of the common videos selected to inspire awe in the students.

The workshop ended with an open forum on the career with discussions commonly venturing into preparations for application to specialty training, competition ratios, lifestyle choices, and opportunities for exposure to research and surgery while in medical school.

Each student was given a booklet that gave an overview of the specialty and the subspecialty options, and tips on application to the specialty (Supplementary material).

Surgeons from the local CTS departments volunteered to teach, and guided student volunteers from the local student surgical society to set up the venue, procure the materials, and run the course. Suturing materials were donated by a company, and animal tissue was donated or bought from local butchers.

Questionnaire

A questionnaire was devised prospectively to examine the demographics and the usefulness of the workshop. The perceived attraction of the specialty was probed using a 10-point Likert-type scale that examined the attraction before and after the course.

Statistical Analysis

The data were entered into IBM SPSS Statistics version 22. Descriptive statistics were used to summarize continuous variables. Wilcoxon test was used to compare the scores before and after the workshop. Pearson correlation was used to assess the scores between years of study. A $p < 0.05$ was considered to be statistically significant.

RESULTS

Five workshops were organized between April 2014 and February 2015 at 3 medical schools in England and Wales. A total of 96 delegates attended the workshops, out of which there were 85 respondents (88.5%). Only undergraduate medical students were included in the analyses, which left 80 responses (Table 1).

In all, 57.5% were male medical students. There was an equal proportion of sexes in the early years of medical school, but was significantly skewed toward male in the later years (Fig. 1).

In answering the Likert-type questions (1—strongly disagree, 5—strongly agree) on the sessions and instructors, students reported the workshop to be interesting (4.8/5), stimulating (4.7/5), and structured (4.7/5), and found

TABLE 1. Demographics

	No.	%
Sex		
Male	46	57.5
Female	34	42.5
Total	80	100.0
Year of study		
1	41	51.2
2	17	21.3
3	12	15.0
4	3	3.8
5	6	7.5
6	1	1.3