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The educational value and emotional impact on medical students after participating in transplant organ retrieval

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Abstract:	Introduction: Medical students and healthcare professionals lack knowledge and confidence in organ transplantation which stems in part from a lack of exposure to transplant surgery at medical school. To address this, we developed a program that allowed students to attend organ retrievals and assessed its efficacy as an educational intervention. Methods: Students were invited to attend organ retrievals through a voluntary program Students then completed an anonymous, self-administered questionnaire (n=40) designed to capture the perceived educational value and emotive impact of attending an organ retrieval, and its effect on career aspirations. Quantitative and qualitative data were analysed. Results: 100% of students would recommend attending an organ retrieval to a colleague. Students strongly agreed that attending an organ retrieval was a useful learning experience (87.5%) and 90% of students felt more confident discussing organ donation with patients and relatives. 50% of students were more likely to pursue a career in transplant surgery. Students recognised a number of difficulties associated with the emotive impact of organ procurement. Conclusion: An organ retrieval program for medical students offers a novel learning opportunity, and may increase knowledge and improve attitudes towards transplantation in future healthcare professionals. However, the emotive impact of exposing students to organ retrievals must also be recognised.

Introduction

Despite continuous efforts to address the disparity between the demand and supply of organs, in the United Kingdom hundreds of patients die on the transplantation waiting list each year[1], and donor shortage remains a fundamental limiting factor.[2] An opt-out system, whereby all adults are presumed to be organ donors unless they have specifically recorded their decision not to be, may help to address this issue, but data from Wales (which moved to a soft opt-out or presumed consent system in 2015) has shown no significant change in donor rates.[3]

All healthcare professionals play a vital role in organ transplantation through identification of potential donors and promotion of organ donation amongst the wider general public.[4,5] Studies have shown that healthcare professionals have limited knowledge of organ donation and transplantation[4], which may contribute to the current high donor refusal rate.[4,6] This knowledge deficit is apparent from an undergraduate level and numerous studies have demonstrated that medical students in the United Kingdom and globally have a poor fundamental understanding of all aspects of transplantation.[5,7] Of note, a study of 216 undergraduates from one UK medical school found that 59.5% would not feel comfortable addressing a patient's questions regarding transplantation.[7]

These issues likely stem from a lack of exposure whilst at medical school and indeed a survey of 523 junior doctors revealed that 84.1% felt they had been inadequately exposed to organ donation and transplantation, with 96.8% stating that it should form part of the undergraduate curriculum.[4] Furthermore, specialty exposure whilst at medical school has been shown to influence career aspirations.[8] At our own institute only a small number of students have a two to three-week placement in transplant surgery over 3 clinical years, and transplantation does not feature on the final year examination syllabus.

To address these problems a number of educational interventions have been described, typically involving lectures, small-group teaching, online learning or role play, which have demonstrated a positive impact on awareness, knowledge and self-efficacy.[9] However, one vital area of transplantation which cannot be replicated with classroom-based teaching is organ retrieval.

Aim:

To develop a program that enables students to attend transplant organ retrievals and evaluate its utility in terms of students' self-perceived knowledge-gain and emotive impact.

Methods

Design:

This program evaluation was undertaken with institutional approval and informed consent from all participants.

Setting:

This program evaluation was performed at the Oxford Transplant Centre, a busy unit undertaking kidney, pancreas, islet and small bowel transplantation. The centre forms part of the United Kingdom National Organ Retrieval Service offering a 24-hour retrieval service every other week.

Population and sampling:

The population consists of medical students in the clinical stage of training from the University of Oxford, and elective students visiting our unit from across the globe. Here we present data for the first 40 participants.

Organ Retrieval Program Design:

A voluntary organ retrieval program was developed in 2015 using webpage stored on the university's secure internet portal, allowing students to sign-up for 12-hour time slots. Local departmental and university approval was obtained, and the program was designed in coordination was the organ procurement team. Students were provided with pre-reading material including practical information on how to sign up for the program, a code-of-conduct outlining behavior and expectations whilst on retrieval, and educational material on the procedural aspects of organ retrieval. Sign-up was voluntary and to raise awareness the program was advertised through student mailing lists and posters. Should a retrieval take place, students were contacted by telephone and invited to attend by the transplant coordinators. As retrievals typically took place at procurement sites outside of our local unit, students would meet and travel with the transplant team. As students attended retrievals with the local transplant team, additional liability cover was not required.

Data collection

An anonymous, self-administered, online questionnaire was developed by the authors using Google Forms and was administered to students within a week of attending an organ retrieval. Questions were designed to capture student and retrieval demographic information (including location, type of organ retrieval, and whether retrievals proceeded to organ retrieval), as well as the perceived value of attending an organ retrieval as a learning experience, the effect on career aspirations, and finally the emotive aspects students experienced whilst on retrieval. Students were offered a certificate of attendance after questionnaire completion.

Data analysis

Quantitative data were presented using descriptive statistics. Where a Likert Scale was used participants were asked to choose from 1-5 with 5 being the best answer. These data were not analysed as continuous variables. Qualitative data were collected in the form of free-text responses and these were independently categorised into themes by two of the authors (AR, JAJ). Differences were resolved by discussion.

Results

Student demographics:

Thirty-six students were undergraduates (studying medicine as a primary degree), and 4 were graduate entry, with the majority of students (60%) in their first year of clinical study. The male to female ratio was 45% vs 55% respectively, and the majority of students (65%) were registered organ donors.

Retrieval Demographics:

Of the 40 retrievals attended, 19 (47.5%) were classified as donation after cardiac death (DCD) and 21 (52.5%) were donation after brainstem death (DBD). The majority (90%) of retrievals proceeded to organ procurement; 4 DCD retrievals did not proceed. A total of 91 organs were retrieved from 20 different centres across the United Kingdom. The most frequently procured organs were kidney (35), liver (27) and pancreas (15). Other organs included heart (4), lungs (4), small intestine (4) and heart valves (2).

Transplant organ retrieval as a learning experience

Students were asked about 3 key perceived educational benefits. Firstly, whether after attending an organ retrieval they felt more confident discussing organ donation (for example, to patients or relatives), secondly whether they found the retrieval a useful learning experience, and finally whether they felt they were included as part of the team. Students

agreed or strongly agreed with all 3 educational benefits in 90% of cases or higher. Furthermore, 97% of students attending organ retrievals that proceeded to surgery, were able to scrub in. All students (100%) would recommend the program to a colleague.

Students were asked if they were more or less likely to donate their organs after attending an organ retrieval. Sixty-five percent of students were more likely, or much more likely to donate their own organs. Only 1 student (2.5%) said they were less likely to donate.

Qualitative free-text responses to self-perceived learning points were categorised into 9 themes (**Figure 1**). Almost all students (98%) identified at least one key learning point. One student felt they learnt nothing, attributing this to the organ procurement being unsuccessful. The most common themes arising were in regard to anatomical knowledge, and aspects of the surgical and logistical procedures undertaken during organ retrieval.

Influence of attending an organ retrieval on career aspirations

Students said they were more likely (65%) or much more likely (50%) to pursue a career in surgery, and transplant surgery. In addition,12.5% said they were less likely or much less likely to pursue a career transplant surgery.

Emotive aspects of organ retrieval

Seventy-two percent of students reported experiencing some difficulties during the retrieval process (**Figure 2**). Of these, 52% were related to the emotive aspects of organ retrieval, including observing cardiac death (n=2), the distressing nature of the surgery (n=4) and other emotive aspects (n=9) (**Figure 2**).

Below are representative quotes from different student's free text responses describing the emotional impact of attending an organ retrieval procedure.

Student 1: Shortly I had a feeling that it is you (transplant team) who are ending the patient's life, although rationally I know that's not true. This was a strange feeling.

Student 2: I found the process of the patient, who looked like they were just under general, even though they were actually brain dead, being cut open and having all their organs removed, to leave an empty thorax and abdomen, quite disturbing to watch, even though I knew it was being done for a good cause.

Student 3: The experience of an operation where the patient is brain dead and then during the operation the ventilation etc. is turned off is quite a different experience and takes a little more time to process, I think.

Discussion

To our knowledge this is the first evaluation of a program enabling students to attend organ retrievals. Our program offers an opportunity for students to obtain real-world experience of organ retrieval that would be not be possible to replicate in a classroom or simulated setting. All students who attended an organ retrieval would recommend the experience to a colleague, and 97.5% felt it was a useful learning experience.

The operating theatre can be a challenging learning environment; however, the educational benefit can be improved when students are able to assist procedures rather than simply observing. In our program, all but one student was able to scrub in and assist the organ retrieval procedure and when asked about key learning points, five students commented on developing surgical skills including how to scrub in and suture. Although no specific teaching instructions were given to the procurement team, they were made aware of

student attendance by the transplant coordinator and over 95% of students agreed or strongly agreed that they felt part of the team during the retrieval demonstrating good engagement.

Many healthcare professionals do not feel comfortable addressing a patient's questions regarding transplantation[5,7], which may contribute to a high donor refusal rate. Physician education has been shown to both increase donation requests and improve procurement rates.[10] 90% of participants in this evaluation reported improved confidence in discussing organ transplantation and students appeared particularly interested in learning about the logistical procedures in organ retrieval, which was the most common theme arising from our qualitative analysis. Furthermore, a favourable attitude toward organ transplantation has previously been shown to improve donor rates[10] and, interestingly, 65% of students in our evaluation stated they were more likely to donate their own organs after attending an organ retrieval.

Over recent years there has been a general decline in undergraduate teaching in surgical specialties, including transplant surgery. This is likely to reduce students' and healthcare professionals' knowledge of transplant surgery, but may also negatively affect students' decisions to pursue a career in the specialty.[8] Our findings reveal that, after attending an organ retrieval, 50% of students felt they were more likely to pursue a career in transplant surgery, whilst conversely, 12.5% of students were less likely which may represent a more realistic understanding of what a career in transplant surgery entails. Supporting this, 4 students reported a greater understanding of the lifestyle of a transplant surgeon, and sleep disturbance was highlighted as one of the aspects of organ retrieval students found challenging. We hope that this initiative will help inspire the next generation of transplant surgeons, and importantly, the early exposure to this challenging area of the specialty will also empower students to make informed career choices.

Transplant surgery is one of the most emotively challenging areas of medicine and students highlighted the emotional challenge of attending an organ retrieval including observing cardiac death, and the distressing nature of the surgery. Moreover, students struggled with concepts relating to end of life and it is important that transplant retrieval teams are aware of these issues when supporting students to attend organ retrievals.

As participation was voluntary, we recognise that the findings of this program evaluation are likely to be subject to selection bias; however, we feel that mandatory attendance at organ retrievals that are infrequent and often take place overnight is neither practical nor desirable. We propose that this should be a supplementary option for those interested in learning more about transplant surgery or considering a career in the specialty, and further studies should focus on obtaining objective measures of learning through pre- and post-retrieval assessment. It is our hope that other transplant units will learn from our experience, and embrace this novel educational opportunity, recognising the benefits in terms of educating students and raising awareness of organ donation but also the emotive impact of exposing students to organ retrievals.

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Figure 1. Qualitative Categorisation of Learning Points Reported by Medical Students After Attending A Transplant Organ Retrieval

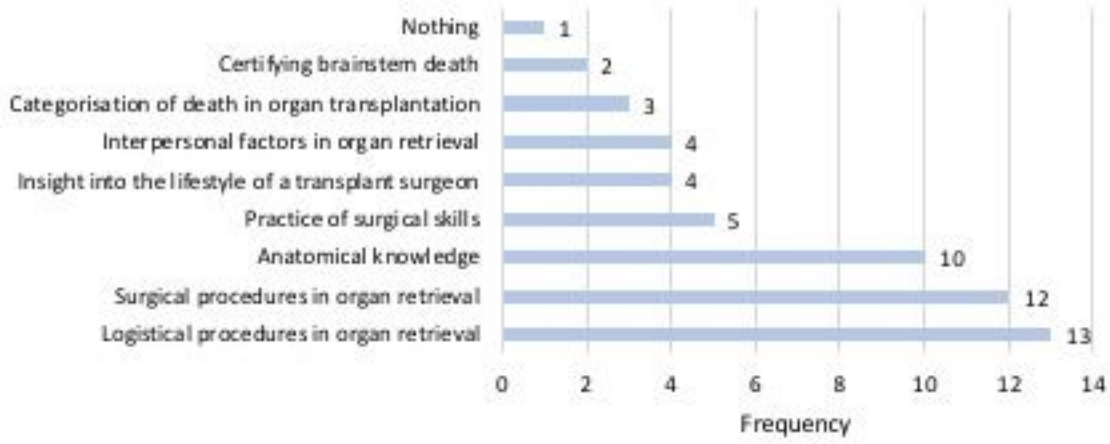
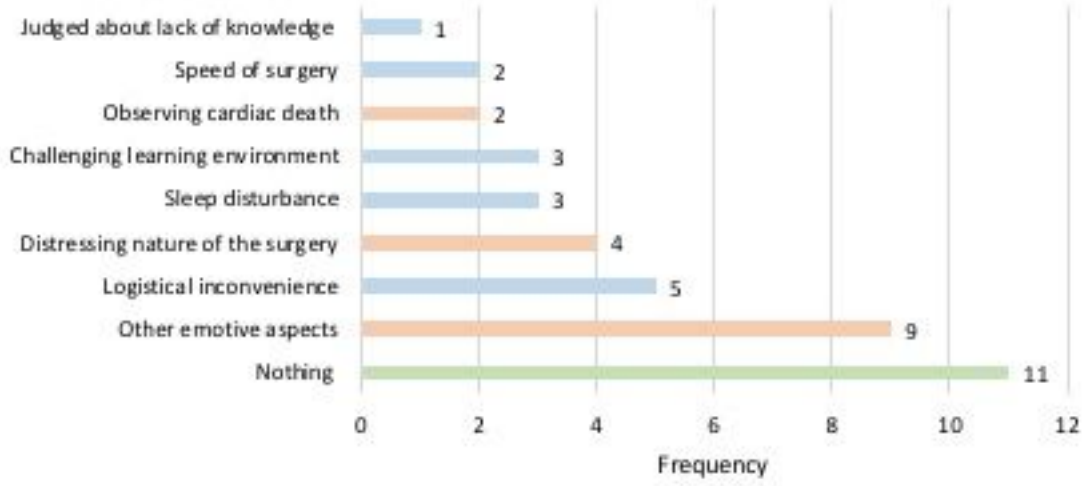


Figure 2. Qualitative Categorisation of Difficulties Experienced by Students During Organ Retrieval



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