

Building bridges with Anatomy: can continuing education in mortuary sciences transform the profession?

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SUMMARY

Human cadavers have long been used to teach anatomy to different cohorts of students. In order to preserve human cadavers these specimens are embalmed using different chemicals by an embalmer with a background in mortuary sciences. The training within mortuary schools is primarily technical based and geared towards the funeral services profession. Meanwhile, embalmers operating within anatomy departments require a different skillset that is currently learned on the job. With the current advancement, there is a need to transform mortuary sciences into a rigorous research-based discipline. For this reason, students and graduates from Cincinnati College of Mortuary Sciences were invited via email to take part in an online questionnaire. The goal is to gauge their interest in continuing education (CE) courses that would prepare them for a career as an embalmer in an academic institution. Eighty-one participants took part in this study. From the 81 participants, 54.3% expressed great interest in learning research skills, 65.4% expressed great interest in conducting research on preservation, 74.1% expressed great interest in advancing their anatomical knowledge and 70.4% expressed great interest in advancing their dissection skills. When asking the participant of their interest in a

summer CE certificate that will help them develop those skills, 66.7% expressed great interest in completing such a program. A CE program providing advanced training in the above-mentioned topics could help transform the embalming profession into a rigorous research-based discipline. Further research is required to investigate the success of such CE programs in equipping graduates with the needed skillset.

Key words: Anatomy – Embalming – Mortuary Sciences – Continuing Education

INTRODUCTION

Human anatomy as a discipline has generally been defined as a branch of biology that deals with the structure of organisms (Jones, 2000). Several sub disciplines fall under the anatomical sciences such as gross anatomy, microscopic anatomy (histology), neuroscience and embryology. From those sciences, gross anatomy is taught to a wide range of students completing different degree programs such as medicine, dentistry, physical/occupational therapy, mortuary sciences, engineering, and art (Balta et al., 2019a). Gross anatomy is primarily taught through lectures and followed by a laboratory practical that might include cadaveric dissection, prosections, plastic

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models, plastinated specimen or computer-based resources (Balta et al., 2020). Using human cadavers to teach human anatomy has been described as a superior method to solidify the taught anatomical knowledge and gain other skills (Korf et al., 2008). This teaching method has not changed for centuries, but the main difference has been the process through which the human materials are obtained.

Human cadavers used to teach anatomy are primarily obtained through body donation programs that are housed within academic units at most universities. Donors sign consent forms before death or are donated after death by their next of kin (laws vary per state). After the donor is received through the body donation program, an embalmer or an anatomy morgue technician will start the process of preparing the body for its use (McHanwell et al., 2020). This process will usually include documenting any observation upon the receipt of the body along with introducing a new identification method, followed by embalming. Embalming is a process of introducing chemicals into the body to slow down the decomposition process and reduce any risk of biological hazard (Balta et al., 2015). Anatomy morgue technicians are trained on how to embalm a human cadaver as part of their degree in mortuary sciences. While this process is somehow similar, there is a huge difference in how the body is prepared for a funeral service compared to its use in academia (Balta et al., 2015).

When preparing a body for a funeral service, the goal is to preserve the body for a short period of time, which ranges between a few of days to a week. Meanwhile, in an anatomy department the preservation period of human material can range between a few months to several years (Balta et al., 2015). Moreover, funeral directors have a huge focus on the aesthetic part of the process, which is not the priority of an anatomy morgue technician. In addition to the use of human material in anatomy, there has been an increasing use of human material in clinical training and the development of medical equipment (Balta et al., 2017). This increasing demand has led to the development of a new research area referred to as Alternative Preservation Techniques. Ideally, the

goal of those techniques is to preserve the body for the longest period possible while retaining similar conditions to that of an unembalmed cadaver (Balta et al., 2019b). The embalming chemicals and protocol utilized during alternative preservation techniques is different to that used in the training of funeral directors in the mortuary science program.

The requirement needed to become licensed as a funeral director/embalmer varies between different states with different institutions offering an Associate or Bachelor's degree in mortuary sciences. However, there is a minimum educational experience required as outlined by three different sources. Those sources are the Manual on Accreditation (2009) and Curriculum Manual (2010) both published by the American Board of Funeral Service Education along with the Funeral Service Practitioner National/State Board Examination Content Online published by the International Conference of Funeral Service Examining Boards (ICGSEB, 2005). The subjects covered in a mortuary science curriculum range from the sciences of embalming, anatomy, restorative art, microbiology, pathology, and chemistry, to the arts including funeral directing, psychology and counseling, ethics, business management, sociology, accounting, and history of embalming. In the state of Ohio, graduates from a mortuary science program are required to take the National Board Exams to become eligible for a license which is earned upon completion of a 1-year apprenticeship under the supervision of a licensed embalmer. Completing those steps ensure the registration as a funeral director in the State of Ohio and to maintain this license, 18 Continuing Education (CE) hours are required every 2-year license term.

In a study by Balta et al. in 2015, authors discuss the need to transform the embalming profession into a research-based discipline to meet the need of alternative preservation techniques within medicine. For this reason, the aim of this study is to investigate the awareness of mortuary science students and graduates of this gap and their interest in pursuing a graduate degree in anatomical embalming and research.

MATERIALS AND METHODS

Study Design

An online questionnaire was developed through OSU QualtricsTM. The questionnaire was then validated by Cincinnati College of Mortuary Science (CCMS) faculty members who completed the questionnaire and provided feedback. This feedback was used to make the necessary changes to the questionnaire.

Emails were used to send out invitations to CCMS current students and graduates that were currently on the college Listserv. The invitation email provided participants with information about the project, how to provide informed consent and take part in the study.

Questionnaire

The questionnaire was divided into two main sections as demonstrated in the attached supplementary document. The first section included questions that aimed at collecting data about the participants' backgrounds. In the second part, students were asked about their awareness of existing careers outside the funeral profession along with their interest in advancing their anatomical knowledge, cadaver dissection skills and research skills. Moreover, participants were also asked about their interest in a summer certificate program to advance the above-mentioned skills along with the option of an online component.

Ethical Approval

Ethical approval was granted for this project by the Cincinnati College of Mortuary Sciences Leadership Board.

RESULTS

Background demographic data was initially collected from all survey participants (n=81). The population of individuals who completed the questionnaire consisted of 77.8% females and 17.3% males, with 4.94% preferring not to specify gender. The majority of participants were aged 20-23 years at 43.2%, followed by 27-30 years at 22.2%, 24-26 years at 16.1%, > 30 years at 13.6%, and < 20 years at 4.9%. The current states of residence among participants included California (3.7%), Florida (1.2%), Illinois (1.2%), Indiana (12.4%), Kentucky (7.4%), Michigan (1.2%), Ohio (67.9%), Oklahoma (1.2%), Virginia (2.5%) and West Virginia (1.2%). These demographic data are summarized in Table 1.

Highest academic degree of participants was reported as follows: 34.6% specified a science bachelor's degree, 19.8% a non-science bachelor's degree, 1.2% a science master's degree, 1.2% a non-science master's degree, and 43.2% specified "other" as their highest level of degree. Of the individuals that specified a highest degree of "other", 65.7% earned an associate's degree, and 34.3% earned a high school diploma. Among those that specified high school diploma as their highest degree, 16.7% were currently working on a bachelor's degree at the time the survey was conducted.

Table 1. Demographics of mortuary science student survey participants in percentages.

Demographics	Percentage of Students				
Age	<20 years (4.9%)	20-23 years (43.2%)	24-26 years (16.1%)	27-30 years (22.2%)	>30 years (13.6%)
Previous Degree	Science Bachelor's (34.6%)	Non-Science Bachelor's (19.8%)	Science Master's (1.2%)	Non-Science Master's (1.2%)	Other (43.2%)
Occupation	Student (59.2%)	Part-time Employment (16.1%)	Full-time Employment (24.7%)	Unemployment (0%)	
Areas of Profession	Funeral Profession (81.8%)		Academic Institution (6.1%)	Other (12.1%)	
Gender	Male (17.3%)		Prefer not to specify (4.9%)	Female (77.8%)	

Regarding occupation of those surveyed, 59.3% were students, 16.1% were part-time employees, 24.7% were full-time employees, and 0% were unemployed. Of those employed, 81.8% worked in the funeral profession, 6.1% worked in an academic institution, and 12.1% specified their work as "other". Areas of work specified as "other" included fields of pathology, tattoo artistry, nursing and animal rescue.

Along with demographic information, survey participants were asked several questions regarding their awareness of career opportunities outside of the funeral profession (see Fig. 1). When asked if interested in a career outside of the funeral profession, 33.33% of participants responded "Yes", 22.2% of participants responded "No" and 44.4% of participants responded "Maybe". Survey participants were asked if they were aware of career opportunities in their field within academic institutions, to which 34.6% responded "Yes", 48.6% responded "No" and 17.3% responded "Maybe".

When asked about interest in gaining work experience within the mortuary unit of an anatomy department, 58.0% of those surveyed responded "to a great extent", 19.8% responded "to a moderate extent", 18.5% responded "to a small extent", and 3.7% responded "not at all".

Extent of interest in expanding anatomical knowledge yielded the following results: 74.1% "to a great extent", 11.1% "to a moderate extent",

14.8% "to a small extent". As shown in Fig. 1., when asked to what extent they were interested in advancing cadaveric dissection skills participants responded "to a great extent" at 70.37%, "to a moderate extent" at 14.8%, "to a small extent" at 9.9%, and "not at all" at 4.9%.

Results of individuals' interest in learning research skills were as follows: 54.3% "to a great extent", 21% "to a moderate extent", 19.8% "to a small extent" and 4.9% "not at all" as demonstrated in Fig. 1. Participants were asked to what extent they were interested in conducting research in alternative preservation methods with responses of 65.4% "to a great extent", 14.8% "to a moderate extent", and 19.8% "to a small extent".

Lastly, participants were asked to what extent they would be interested in completing a summer certificate program established as a collaboration between Cincinnati College of Mortuary Science and The Ohio State University. Students were notified that the certificate program would cover detailed anatomy, alternative preservation techniques and research. The participants responded with the following feedback: 66.7% "to a great extent", 13.6% "to a moderate extent", 17.3% "to a small extent" and 2.5% "not at all". When asked to what extent having this certificate program offered online would be helpful for them, of those surveyed 55.6% responded "to a great extent", 17.3% "to a moderate extent", 17.3% "to a small extent" and 9.9% "not at all".

Survey Data

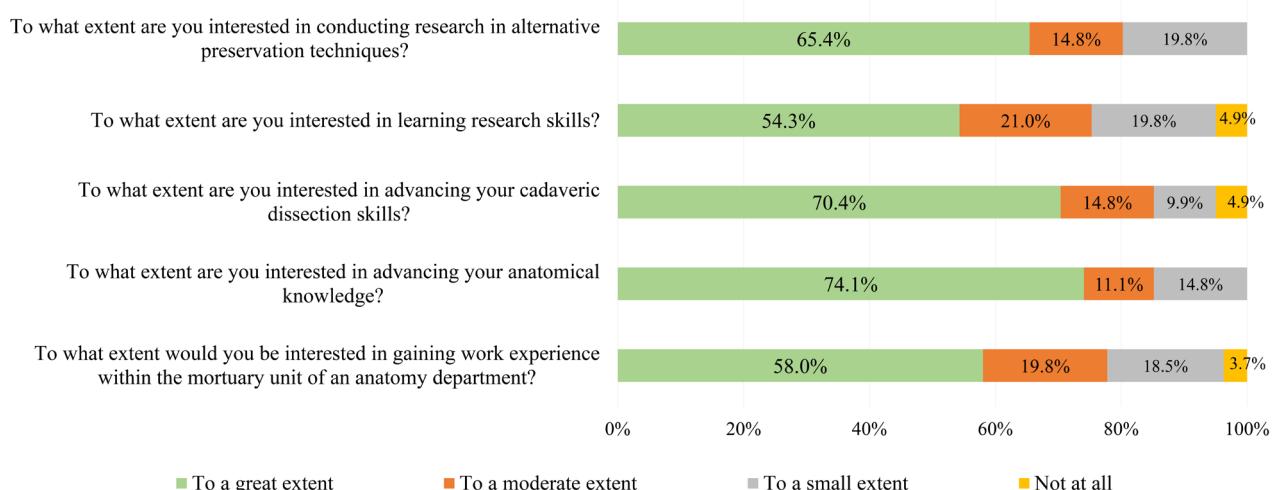


Fig. 1.- Survey response data of mortuary science student participants on five different questions.

Participants were free to leave comments following the survey, and many of the participant comments mentioned their lack of knowledge regarding mortuary career opportunities within academia. Many of these participants were eager to learn more about these additional career opportunities, especially within the field of anatomy.

DISCUSSION

Mortuary Science and Anatomy

With the increased utility of human body donors in academic institutions, there is a need to advance the scholarship on preservation of human body donors. This need has been demonstrated in literature as clinicians and medical equipment companies rely on body donors to improve patient care (Balta et al., 2015). Human body donors are able to provide a safe and reliable simulator to what clinicians will experience in their practice. Moreover, there has recently been an increased interest in using alternative preservation techniques to teach anatomy. This is due to the fact that the currently used embalming methods alter the quality of tissue of the embalmed donors. For this reason, the aim of this study is to start this process and investigate the potential interest within the mortuary science profession.

The operation of body donation programs requires a trained embalmer to preserve the donated human bodies. While some of those embalmers would have a training in mortuary sciences, many of them have learned about the embalming process through experience. This could be due to the lack of regulations associated with the operations of body donation programs or other reasons related to the funeral services profession. Some of these reasons could be related to the annual income received by a funeral director compared to that of an anatomy morgue technician (embalmer). Another reason could be the lack of awareness of potential career opportunities within academic institutions as demonstrated by the findings of this study as only 34.6% expressed their knowledge of such opportunities.

Anatomists lack the training associated with embalming and preservation of the human

body. For this reason, there is a need to engage with the discipline experts within mortuary sciences to help advance the discipline. The main challenge associated with this endeavor is that the current mortuary science training program does not prepare its graduates for a career in academia. Even though a bachelor's degree in mortuary sciences is offered at CCMS, many of the graduates exit with an Associate's degree (28.4%) as shown by the findings of this study. That could be due to the fact that only two states (Ohio & Minnesota, USA) require a Bachelor degree to become licensed to practice as a funeral director/embalmer. This level of training does not provide graduates with enough expertise in anatomy or research to contribute to the scholarship of human cadaveric embalming.

Continuing Education

One of the possible options to provide such training is through a continuing education certification program. Of those who participated in this study, 66.7% expressed great interest in completing a summer certificate program as a collaboration between a college of mortuary sciences and a research focused institution of higher education. This type of training will help mortuary science graduates who are trained to become a funeral director gain expertise necessary for a career in an academic institution. Based on the currently existing mortuary science programs, two main areas were identified for potential growth. The first area is advanced anatomy knowledge accompanied by dissection skills. While all mortuary science programs cover the anatomy of the human body, working in an anatomy department would require a more detailed level of anatomy in order to contribute to the technical support needed for all academic programming. From the participating graduates and trainees 74.1% have expressed great interest in advancing their anatomical knowledge and 70.4% have expressed great interest in advancing their cadaveric dissection.

Another significantly important area of development is within the scholarship of discovery. While embalming dates back to historic civilizations such as the Egyptians, the

process is not very well documented and many of the procedures are passed on by word of mouth or within institutional knowledge (Balta et al., 2015). Training embalmers on the process of scientific discovery will help them investigate, assess and document their work to be shared with their community of scholars. This will also enable scholars within the discipline to assess and provide feedback on such work, which will eventually help in increasing rigor of the scholarly work within the discipline. For this reason, participants were asked about their interest in learning research skills and 54.3% have expressed a great interest in learning such skills while 61.4% have expressed great interest in conducting research on alternative preservation techniques.

Even though the goal of such continuing education courses is to increase awareness of embalming jobs within academic institutions as 48.2% of participants indicated that they are not aware of career opportunities and especially that only 44.4% of participants said they were not interested in a career outside the funeral profession, several challenges could phase such initiative. One of the main challenges highlighted by the participants was the lack of confidence in taking on such initiative or as described by one participant *"It is intimidating to think about a job within academic institutions as I don't feel that my degree prepared me for it"*. This goes back to the nature of the profession as it is primarily funeral service professionally oriented as opposed to academia. Other challenges could be internal within academic institutions as development of new programs will require the proof of strong demand which might be difficult to demonstrate as this will address a need within a small profession.

Several factors could limit the findings of this study. One of the main limitations is the fact that this study was conducted with participants from one institution within one part of the United States. A larger study is needed to span the US and potentially at the international level. Another limitation of this study is that some participants are currently registered students who do not have enough working experience to make an informed opinion about career options.

The need for advancement in the training of mortuary science practitioners has been demonstrated. The findings of this study show that participants were interested in advancing their anatomical knowledge, dissection skills, research skills and investigating alternative preservation techniques. Moreover, a continuing education program providing advanced training in the above mentioned topics could help transform the embalming profession into a research-based discipline.

List of Abbreviations:

CE: Continuing Education

CCMS: Cincinnati College of Mortuary Sciences

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