

# **Students' Attitudes towards Commemorations and Memorials in Anatomy Education**

*A thesis presented in candidature for the degree of Master of Research*

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## DEDICATION

*This thesis is dedicated to all those whose bodies that have been used to further anatomical knowledge.*

***“Indeed, one can always be more humane but never overly humane...”***

Goran Štrkalj, *Humanistic Anatomy*

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## **ABSTRACT**

Commemorative ceremonies and memorial objects/places have been established at many institutions globally to honour body donors in anatomical education. Questions remain on attitudes of main stakeholders, students included, towards these ceremonies. The aim of this study was to explore anatomy students' attitudes towards commemorations at the institution which has not introduced these ceremonies yet. This study was a questionnaire-based survey, carried out on Macquarie University's anatomy students at various stages of their education, both exposed and not yet exposed to human remains. A total of 734 past and current anatomy students participated in the survey (response rate 69.8%). Majority of respondents were in favour of introducing a commemoration and a memorial for donors. Differences were found in attitudes associated with gender, attitudes towards body donation and level of exposure to human remains. Ethnicity and religion seemed to have no influence on attitudes. There was a preference for the commemoration to be secular, identities of donors to be revealed, and not recorded for social media. Results show high level of students' support towards establishment of commemorations and memorials. This support transcended cultural and religious boundaries and confirmed students' respectful attitudes and acknowledged the importance and appreciation of the "anatomical gift".

## **CANDIDATE STATEMENT**

I certify that the work incorporated in this thesis has not been submitted for a higher degree to any other university or institution.

I certify that the work presented in this thesis is my own except where otherwise acknowledged and referenced in the text.

Ethics committee approval has been obtained from the Macquarie University Human Resources Ethics Committee (Reference number: 5201800248) (Appendix 8.3)

Joyce El-Haddad

11 October 2018

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## LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
BChiroSci	Bachelor of Chiropractic Sciences
BClinSci	Bachelor of Clinical Sciences
BHumSci	Bachelor of Human Sciences
BMedSci	Bachelor of Medical Sciences
BSci	Bachelor of Sciences
CD	Chiropractic Department
D.Pt	Doctor of Physiotherapy
DBS	Department of Biomedical Sciences
FMHS	Faculty of Medicine and Health Sciences
FSE	Faculty of Science and Engineering
G1	Group 1 - No Exposure
G2	Group 2 - Current Exposure
G3	Group 3- Past Exposure
HLTH108	Introduction to Anatomy
HLTH109	Anatomy of the Limbs and Back
HLTH213	Anatomy of Head, Neck and Trunk
HLTH214	Neuroanatomy
IFAA	International Federation of Associations of Anatomists
MChiroSci	Masters of Chiropractic Sciences
MRes	Masters of Research
MEDI201	Cardiorespiratory 1
MEDI202	Renal and Alimentary 1
MEDI203	Musculoskeletal 1
MEDI204	Neuroscience 1
MEDI301	Cardiorespiratory 2
MEDI302	Renal and Alimentary 2
MEDI303	Neuroscience 2
MU	Macquarie University
PICF	Participant Information and Consent Form

## 1. INTRODUCTION

Over recent years, exponential growth of medical and scientific knowledge has unlocked a new era for medical practice (1). This has caused medical educators to transform their programs to maintain relevance and efficacy (1). The pressure of change also stems from the advancement of technology and educational research (2, 3). Access to new technologies and recognition of the various learning and teaching styles have triggered the revolution of medical education and consequently, anatomy education (4-6).

Human anatomy is one of the oldest scientific disciplines (1). It concerns itself with the intricate architecture, arrangement and function of the human body (2, 3), and plays a fundamental role in medical and life sciences education. It is well established that sound knowledge of human anatomy underlies effective medical and field practice (3).

The rise of new disciplines such as genomics and molecular sciences, have caused modern medical curricula to somewhat sideline anatomy. Consequently, this has been met by requirements to deliver anatomical content in a smaller time frame (7, 8). In some institutions, traditional pedagogies such as dissection have been substituted by inspection of models, imaging (9), and virtual stimulation (5), even though research on the efficacy and effectiveness of these modern teaching methods are still relatively recent (6, 8, 10, 11). However, many anatomy educators worldwide, have welcomed the inevitable shift in approach to anatomy teaching and have incorporated both traditional and modern pedagogies to better align the discipline with the evolving medical programs (1, 12, 13).

It could be argued that the transformation of modern anatomy education can be encapsulated in four major changes. Firstly, anatomy educators have shifted focus from clinically irrelevant anatomical detail, to an improved alignment of their programs with relevant educational outcomes (1, 4). Secondly, anatomists have resurrected previously disregarded topics such as surface anatomy (9), and medical imaging-based anatomy (9, 10). Thirdly, many anatomy programs have integrated the opportunity for students to develop their professional skills during early stages of their education (1). Finally, there is a positive and a humane shift in the attitudes towards the treatment and acquisition of bodies for the anatomy laboratory (1, 14-20). Therefore,

as a result of these changes, anatomy has become more humane, efficient and better integrated with clinical subjects (1).

Because of its significance in medical education, anatomy has been closely scrutinised and often severely criticised over its teaching methods and utilisation of resources (2, 21).

Cadaveric dissection or prosection have been the traditional teaching strategies in anatomy education (7, 8). In recent decades, the financial burden of cadaver-based teaching and the availability of other resources such as plastic models, medical images and three-dimensional (3-D) printed models, have caused the use of cadavers in anatomy education to lose their centrality in many institutions (11).

However, many studies suggest that work with cadavers, whether through dissection or prosection remain the key elements in anatomy education (7, 8, 11, 22-24). It has also been suggested in several recent studies that the most effective way to teach anatomy might be a combination of traditional and modern approaches - that is, through dissection/prosection in conjunction with other modalities (5, 6, 8, 10, 11, 25, 26). Among other benefits, this approach is thought to bridge the gap between the millennial learner and the anatomy educator (7, 8, 11, 22-24).

The complex history of the use of human remains in anatomy is challenging both scientifically and ethically (27). Andreas Vesalius (1514-1564), the founder of modern anatomy, used dissection of human remains as his primary tool to investigate anatomical structures (28). Vesalius' approach to anatomy allowed him to build and correct anatomical knowledge (28, 29). This approach prevailed as a primary teaching and research tool in anatomy (29). However, when considering the relevant ethical aspects, it is often forgotten that Vesalius and his students often acquired bodies in a dubious manner (which included stealing of human remains) even by the 16<sup>th</sup> century standards.

From the late 18<sup>th</sup> and early 19<sup>th</sup> century, the medical profession began to expand (29). The means in which bodies for anatomy were obtained were primarily from executed criminals (29). The number of bodies obtained this way was usually insufficient in terms of meeting the demands of medical education (29, 30). Consequently, this placed anatomists in a difficult situation and forced them to engage in illegal activities such as stealing cadavers from graveyards and mortuaries - directly or via organised gangs of body snatchers (29). At times, these extreme behaviours even

led criminals to obtain bodies by murdering the vulnerable such as women (31), the poor and the homeless and selling them to medical schools (30).

With the introduction of the Anatomy Act around Europe (in most places at the beginning of the 19<sup>th</sup> century), these notorious crimes began to dissipate, leading to unclaimed bodies from hospitals, asylums and workhouses being the main source for dissection. Donated bodies were a rarity until the mid-20<sup>th</sup> century (29, 32, 33). Today, although there are many legislations worldwide that only permit donated bodies to be used for anatomy education (34), the use of ethically questionable reliance of unclaimed bodies still remains a problematic area in many countries (1, 34).

Regardless of the ways that a body was obtained, dispassionate treatment in the laboratory was throughout history, the norm (1, 31). In order to avoid emotional burden posed by work with human remains, students were encouraged to be emotionally detach and to treat the cadavers as objects. This strategy was also meant to help students create a similar detachment to their future patients (1, 31).

It is therefore not surprising that the relationship between anatomists and the public was strenuous. Today's attitudes towards cadavers have experienced significant changes, in that educators do not discourage empathy in the laboratory- instead, they endorse it (1, 14, 16, 19, 29). In attempts to motivate empathy and rectify the strenuous relationship with the public, many medical schools have incorporated ceremonies to honour and express gratitude to past, present and future donors and their families into their programs (1, 14, 16, 19, 29).

Whether institutions incorporate dissection or prosection in their anatomy programs, it can be universally agreed that respect to those who bequeath their bodies to medical education and research, should be practiced first and foremost. The changes that anatomy education has experienced has influenced the way bodies are acquired and how they are treated in the laboratory. Incorporation of acts or places that honour body donors are some of the ways the humane approach integrates the *human* in human anatomy.

As a consequence of the relative novelty of these phenomena and lack of research around the way body donors are honoured in anatomy education, there exists diversity in the terminology used. In

this thesis, the term ‘commemoration’ will be used to refer to activities and events that are held to pay respect to donors, whereas the term ‘memorial’ will be used to refer to objects and spaces that are put in place to honour those whose bodies have been donated to medical education and research (14-16, 19, 29, 35).

The structure and format of the commemorations and memorials can vary in many different aspects (16, 29). For example, some commemorations can be organised by faculty members only whereas, some are organised by collaborating with students or by students independently (29). Commemorations can be religious or secular. Some reveal the donors’ identities, others keep identities anonymous. Commemorations and memorials tend to serve the same purpose which is to provide educators, students and the public to honour and express gratitude to past, present and future donors and their families (14, 19, 29). The marked differences in both commemorations and memorials often reflect the cultural customs of the community of origin (19, 35).

Research on commemorations and memorials in anatomy education is still in its infancy. There is room for development in such a way that they reflect the attitudes of the main stakeholders in anatomy i.e. students, anatomists, body donors and their families. To date, there are very few studies investigating the attitudes of these stakeholders towards anatomical commemorations and memorials. No studies have been yet carried out on the students’ attitudes towards commemorations or memorials prior to their introduction at various institutions.

## **1.1 Aims and Objectives**

The aims of this study were to:

- 1.1.01* Investigate anatomy students’ attitudes towards commemorations and memorials in anatomy education at Macquarie University (MU), an institution which still has not implemented them.
- 1.1.02* Recommend the preferred format of commemoration and memorial for Macquarie University, and provide further general recommendations for Australian and global anatomical communities.

To achieve the above aims, the study pursued the following objectives:

- 1.2.01 Establish if the students are in favour of carrying out commemorations and building up a memorial at MU.
- 1.2.02 Assess what is the preferred format of commemorations and memorials in terms of timing, organisation, attendance, religious and community representation, use of modalities, and role of social media.
- 1.2.03 Investigate how the following personal features relate to their attitudes towards commemorations and memorials in anatomy: gender, ethnicity, religious orientation, exposure to human remains and attitudes towards body donation.
- 1.2.04 Relate and compare these findings to current practices in commemorating and memorialising body donors in anatomy programs across the world.



## **2. BACKGROUND**

Occasions that have great emotional significance have been celebrated, commemorated, and memorialised in many different forms since the dawn of humanity (36). As a species, there is a tendency to commemorate anything that has served emotional importance and added significance to our lives. The way in which social groups commemorate or memorialise important events, persons or dates is incredibly diverse (36, 37).

In anatomy education, commemorations and memorials are emerging phenomena, and therefore have relatively few papers devoted to them. Most of the papers are descriptive and include short communications. In addition, some data on commemorations and memorials are provided in papers dealing with related subjects such as body donation and anatomy curricula.

Furthermore, since this is a relatively unexplored area, there also exists inconsistencies in terminology when referring to ceremonies. To avoid terminological confusion, in this review, the term 'commemoration' will be used as an umbrella term to refer to all events and activities carried out to honour body donors. The term 'memorial' will be used to refer to spaces (such as memorial parks, shrines etc.) and objects (monuments, plaques etc.) built to honour body donors (29, 38).

The emerging phenomena of commemorations and memorials in anatomy education are playing an increasingly important role at many educational institutions. They address different stakeholders and are performed within different cultural milieus.

The aims of this chapter are to provide an overview and comparison of current practices and identify common patterns. Investigation of the aims will contribute not only towards better understanding of these phenomena but will assist in their future application. More broadly it will potentially contribute towards improving the delivery of anatomy education, developing professional skills, improving relationships between anatomy departments and general public as well as humanising science, medical education and practice.

### **2.1 Search Design and Methodology**

A narrative literature review related to commemorations and memorials in anatomy education was conducted. Meaningful meta-analysis was prohibited since, except for three surveys, all papers on the topic were descriptive in nature. The process of conducting the search of articles for this review followed narrative review guidelines from anatomical research set out by Henry and

colleagues (39). These guidelines suggest that a narrative review should incorporate search strategies of a systematic review (39).

Scopus, PubMed and Google Scholar were the databases used in articles search. Additional sources were retrieved from bibliographies and references cited. The search strategy and the Medical Subject Heading (MeSH) terms used for the search are shown in Table 2.1.

There were no restrictions on dates of publication, as it was relevant to see changes in formatting trends of the commemorations and memorials over time. The cut-off date for articles publication was May 2018. Articles were included if they were related to commemorations, memorials, ceremonies in anatomy education, body donation, and humanistic anatomy. Inclusion and exclusion criteria for this review is shown in Table 2.2.

The selected studies included descriptive and quantitative studies. A limitation to this review is that descriptive literature carries a risk of bias and can be highly subjective. Some other limitations include subjective selection bias of articles, findings and conclusions drawn from this narrative style review cannot be reproduced as they may be subjective. To counteract such limitations, articles selected for review were cross checked by one of the project supervisors (GŠ).

Search Term	Search Hits
<b>Commemoration AND/OR memorial AND anatomy</b>	405
<b>Convocation of thanks AND anatomy</b>	5
<b>Service of thanksgiving AND/OR gratitude AND anatomy</b>	278
<b>Dedication Service AND/OR ceremony AND anatomy</b>	246
<b>Body Donation AND anatomy</b>	401

**Table 2.1: Search terms and search hits**

<b><i>Inclusion Criteria</i></b>	<b><i>Exclusion Criteria</i></b>
<ul style="list-style-type: none"> <li>• <b><i>Recommendation guidelines for anatomy memorials and commemorations</i></b></li> <li>• <b><i>Related to memorials and commemorations in anatomy education</i></b></li> <li>• <b><i>Commentary articles related to anatomy memorial and commemoration ceremonies</i></b></li> <li>• <b><i>Short communication articles on commemorations and/or memorials in anatomy education</i></b></li> <li>• <b><i>Written in English</i></b></li> <li>• <b><i>Related to body donation to anatomy education</i></b></li> <li>• <b><i>Related to concepts of humanistic anatomy</i></b></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Not written in English</i></li> <li>• <i>Related to burial practices</i></li> <li>• <i>Related to funeral practices</i></li> <li>• <i>Clinical anatomy papers</i></li> </ul>

**Table 2.2: Inclusion and exclusion criteria**

A total number of 50 articles fit the inclusion criteria. Articles were grouped according to their focus on either commemorations or memorials. In articles dealing with commemorations, three major themes (and several sub-themes) were identified – frequency, management and the purpose of commemorations.

## **2.2 Discussion of the literature**

### *2.2.01 Commemorations*

#### *Frequency*

In this review, frequency of anatomy commemorations will denote two aspects: 1) geographical - how many exist worldwide, and 2) annual - if present, how often they are carried out during the academic year. Commemorations in anatomy programs have had a relatively long-standing tradition in some institutions (25, 40-42) and a newly developed event in others (25, 29). For example, the practice of holding annual ceremonies to honour body donors dates back to the Edo period (1603-1868) in Japan and 100 years ago in Taiwan (42). The earliest reports of these ceremonies existing in western cultures are from the 1960's in the United Kingdom and 1970's in the United States (25).

Anatomy ceremonies, however, are not unique to the countries mentioned above. The consistent rise of these ceremonies reflects the paradigm shift in attitudes towards body donors (1, 25, 29).

There have been reports on the existence of commemorations in anatomy from a large number of countries including Australia (43), Brazil (44), China (45, 46), Germany (19, 35), Japan (47), Korea (48), Netherlands (41, 49, 50), New Zealand (51, 52), Taiwan (53), Thailand (12), and Vietnam (19).

However, the total number of commemorations in anatomy education that exist globally remains unknown and details of the frequencies of these events are limited. The literature suggests that, on average, with the exception of commemorations in Thailand (12, 13), commemorations occur once in an academic year in most institutions (29). To date, there only exists two studies from the United States (19, 25), and Germany (19, 25), where anatomy institutions from both countries participated in a survey based study to report on the existence of commemorations and their details (19, 25).

Both studies revealed that majority of anatomy institutions from these two countries currently have a form of commemoration incorporated into their curricula to honour body donors (19, 25). In addition, both studies noted that the rise of these commemoration is a recent phenomenon, where such patterns were attributed to the humanistic approach that shapes modern anatomy programs. The study from Germany reported that there was an even split in time of the day that the ceremonies were carried out, where almost half were carried out in the morning and the other in the afternoon (19). This variation exists simply as a response to different time schedules of the curricula and possible collision with lecture and tutorial times (19). Neither of the studies reported on the duration of the commemorations.

Similarly, studies from Taiwan state that medical schools have incorporated a “silent mentor” initiation ceremony, where it is suggested that this event occurs once a year before the dissection course commences (53). However, reports on the number of medical schools that incorporate this notion in Taiwan has not yet been reported.

In addition, two separate reports from Thailand, state that there exists two forms of ceremonies every year in anatomy programs (12, 42). The first, known as a dedication ceremony marks the beginning of the ceremony and the student-donor relationship is established. The second occurs after the dissection course is completed and this ceremony is suggested to be a bigger and a more formal event (12). However, similar to the paper from Taiwan (53), reports on the number of medical schools that incorporate this notion in Taiwan has not been yet reported.

Having two ceremonies, before and after the dissection course is not unique to Thailand. In the University of Otago, the *whakawātea* (clearing of the way) ceremony is conducted before teaching

using any cadaveric material commences (54). The first ceremony took place in 1989 (54). It was also reported that commemoration that take place each after the dissection course is completed, towards the end of the academic year (54).

Further insight into how many commemorations exist globally will arm anatomy educators to justify such reinforcement of the humanistic shift in anatomy education. Instilling similar methodological approaches such as national surveys carried out by Jones (25), and Pabst (19), groups will aid to further uncover the geographical and annual frequencies of anatomy ceremonies. When such data is gathered, perhaps it is then a meaningful meta-analysis can be completed concerning the frequency of commemorations in anatomy education.

#### Organisation, Attendance and Modalities

Literature on the organisation and planning of commemorations in anatomy education is limited. Most papers used in this review suggest that commemorations are organised by either medical students (10, 12-14, 25, 29, 40, 42, 50, 52, 55, 56), anatomy staff (19), or by both stakeholders in collaboration (43).

From the few articles that report reasons why students organise such events, it is proposed that they do so on the basis that they perceive it as a chance to personally give back to the donors and their families (13, 42, 43), suggesting gratitude and empathy towards body donors and donor families.

A study from the United States, reported independently the involvement of medical students and a small percentage of allied health students in organisation the event (25). The small number of allied health students involved in organisation of these events might signal the need to be more inclusive to all stakeholders of anatomy education when organising commemorations, and not solely catered to medical students.

Several papers have reported the involvement of a community representative of either, religious significance (19, 25), or cultural significance (52, 54). For example, commemorations in several German institutions are organised by anatomy students, staff and religious clergymen (19).

Examples of cultural representations are found in several papers. In the University of Otago, New Zealand, commemorations that exist are shaped in such a way that they reflect the culture beliefs of Māori (52, 54). In Māori culture, a dead body is recognised as sacred (*tapu*), therefore making it necessary for Māori anatomy students to partake in an annual ritual that allows them to enter and work in the dissection room (52, 54). The ritual is known as a 'clearing of the way' ceremony

(*whakawātea*) organised by the Department of Anatomy, and is aimed to free and clear any anticipated fear of transgressing cultural norms that may hinder learning and produce distress among the Māori students (52, 54). Interestingly, although the *whakawātea* ceremony was put in place specifically for Māori anatomy students, it has been since reported that it has attracted students from different cultures on the basis that it helped them feel more comfortable about entering the dissection room (52, 54). Furthermore, it has been found that the ceremony allowed for students to pay their respects and offer thanks to the donors before they commence dissection (52, 54).

Except one study (25), there are no reports on how funding is acquired to pursue these anatomical commemorations. Limitations in literature such as this, create difficulty to uniformise and assess guidelines.

Organisation of anatomical commemorations seem to include preparation of modalities such as reflective readings, poems, artworks (42), and performances (42, 55) that are carried out during the event. One duty also includes inviting the appropriate parties to the commemoration such as staff members, community representatives, media and families of donors (12, 43, 54).

It appears that the commemorations around the globe have been organised almost spontaneously as a response to an obvious ethical void and thus with no prior consultation from some of the main stakeholders – body donors, their families and the community (10, 12-14, 25, 29, 40, 42, 50, 52, 55, 56). In the past, the lack of universal guidelines has led aspects of anatomy that carry ethical weighting open to interpretation and thus carried a risk of being problematic and at often times, were indeed problematic (57-59).

It is clear that guidelines on how to approach these aspects of organising the commemorations and memorials in anatomy are needed (60), particularly when organisation, is being left in the hands of first-year medical students. There is a need for studies that will explore the attitudes of the main stakeholders in anatomy education and explore reasons for partaking in the organisation of commemorations. Furthermore, investigation into the influence of certain characteristics and willingness to organise such as: age, gender, attitudes towards body donation, and level of education would provide deeper insight into this emerging phenomenon.

#### Donor identity

Patterns from studies concerned with commemorations in anatomy education are inconsistent in whether donor identities are revealed during a commemorative ceremony. As a result, in some

commemorations, anonymity is maintained whereas in others, identities are revealed and some students in fact, meet with the family of donors. Reasons as to why such variations exist remain unclear.

For example, in Germany it was reported that 48% of institutions revealed names of donors in the commemoration, while 65% did not (19). In the United States, there was an even split, where 47.6% of institutions reported that they reveal the names, and 47.8% did not and 4.8% did not respond to this matter, which may suggest hesitation due to concern of controversy.

There are several reports that state that most students have expressed desire for the names of the donors that were dissected during their course to be revealed (50, 55, 61). Some students reported that revealing names created a greater sense of professional responsibility and relieved some anxiety acquired from dissection (55, 62).

There seems however to be a consistent support for the reveal of identities, mirroring the humanistic paradigm shift in anatomy education. In that more recently established commemorations reveal the identities (with consent from the donor and next of kin) as a way to reinforce the *human being* in the *human cadaver* (62).

Of interest, it has been reported that most donors do not wish to remain anonymous, and times have written letters and poems that did not reach the students (55). It is clear that, communication and a more humanistic relationship between donors and students is desired by both stakeholders. Again, this suggests that consultation with all stakeholders, especially future donors prior to these commemorations is essential, in order to ensure that these events are carried out in a way where wishes of donors are reflected, thus amounting to well thought out and meaningful occasions.

#### Purpose of commemorations in anatomy education

The literature shows that commemorations address different stakeholders and have multiple purposes.

##### a) Expression of gratitude

Expression of gratitude towards body donors takes form in various ways depending on the country and culture of origin (19). Expression of gratitude and appreciation from students towards body donors through commemorations in anatomy education is a reflection of the paradigm shift in the discipline (19).

It is proposed that this is the main reason why such matters in anatomy education exist (12, 19, 63-65). Incorporation of modalities such as, artworks, music performances and readings of poems and stories of students' experiences in the dissection lab are ways in which appreciation for the noble gift from the donor is conveyed (40, 55, 61, 63, 65-67).

There are other modalities incorporated in these commemorations as ways to symbolise the concept of gratitude to also reflect cultural and religious significance of the community of origin. For example, in Vietnam, the expression of gratitude is conveyed by the decoration of the walls of the dissection room and placement of flowers around the donors' heads (19). On the other hand, as mentioned before in Thailand, donors are honoured with the title of '*Arjan Yai*' (the great teacher) in a *Waikhru* (dedication) ceremony (12, 13). The title of '*Arjan Yai*' is a symbol of the deep gratitude felt towards the donors, as teachers in Thailand are highly regarded to an extent unfamiliar to western cultures (12, 13).

Commemorations can also be seen as a way that the students and teachers of anatomy can begin to reciprocate a gift to education that is unparalleled. It is suggested that along with educational platforms, strengthening humanistic education and ethics - providing avenues for students to express gratitude towards body donors is the basis of setting up a successful body donation program (45). Implementing these strategies has proven successful at the Nanjin Medical University, China, where 70 body donations were received in 2012, as opposed to 10 body donations received in 2001 (68).

Similarly, in South Korea, there has been a dramatic increase in the number of body donations received per year (45, 68). One of the factors this increase was attributed to was the organisation of 'donor-appreciation' ceremonies in Catholic-based, Buddhist-based schools as well as secular universities (45, 68).

Bolt (2012), discussed Marcel Mauss' (1990), anthropological analysis of gift giving, where it is suggested that gift giving automatically creates social ties between the giver and the gift-receiver, as a result of the expectation to give something back in return. The theory states that gifts are never free and imply the obligation to reciprocate (49). This theory suggests that not only do students perceive body donations as gifts, and that commemorations provide space for the students to express gratitude towards body donors, but potential and future body donors themselves and their families are able to see firsthand the appreciation, benefits and educational rewards that come from donating ones' body to medical education.



Commemorations in anatomy education therefore seem to provide an opportunity for students and academic staff to reciprocate donors' "gift". In particular where commemorations honour the donors with titles that have a highly regarded status in the society of the community of origin (12, 13), as well as ceremonies where donor names are revealed (25, 49). Furthermore, the humane shift in anatomy education also tends to fulfil donors' wishes in that being empathetic, compassionate and respectful towards bodies of the donors as well as being open about the educational rewards received - donors' personal reputation and status can be continued to be enhanced (41, 49).

b) Psychological support for students

The anatomy laboratory is a space where students acquire knowledge that is the cornerstone for many degrees, particularly in medical and health disciplines. It is also a space where students can prepare for the emotional work that is required in patient care (56). However, studies suggest that due to a lack of emotional and psychological support available in the anatomy laboratory, working with cadavers can at times be the cause distress and anxiety experienced by students (42, 55, 56, 69-71). Questions about self-morality and morbid curiosity are also often arisen, only to be met by a lack of encouragement due to time constrictions and limited space for discussion and conversation (42, 55, 56, 69-71).

Commemorations in anatomy education seem to diminish the associated stresses with dissection (56). For example, it is reported that students felt out of control of their feelings in the laboratory as there was no room to express and explore the emotions felt during the dissection process (55, 70). However, students also reported that the anatomy commemoration provided them with some closure as they were more aware about concepts of death and dying and the importance of compassion (55, 70). There seems to be gaps in the literature exploring if students who are exposed to prosections as opposed to dissections experience the same distress. Exploring this, would reinforce the appropriate formatting trends of commemorations in anatomy education where prosections are used, so that the events also provide students with closure if need be.

In this context, it might be profitable to refer to a recent study that investigated whether the belief of a soul had any impact on students in their dissection experience. It was found that students who believed in the concept of a soul were found to be less anxious when they encountered a dead body in the anatomy laboratory, relative to those who did not believe in a concept of a soul (72). It would be insightful to explore the link between the gained benefits from

a commemoration in anatomy received by those who have a belief in a soul, relative to those who do not.

c) Closure for donor families

The large number of family members attending anatomy commemorations at different universities globally (12, 50, 67), suggests that these events in anatomy education provide donor families with some form of closure. Kooloos and colleagues, suggested that donor kin are often left with limited time to farewell their deceased and often have a difficult time with the grieving process (50).

Moreover, in Otago, families of donors often have difficulties with the grieving process as there is an interruption to usual funeral processes as well as concerns with what happens to the bodies of the donors once the body was in the laboratory (52, 54). Furthermore, there is at some medical school a rather long period of time (in some cases up to eight years) between the death of the donor and the disposal (usually a cremation) of the remains; this time gap may make it difficult for them to gain closure (16).

Reports from Netherlands, provide yet another example of family members of donors finding closure from these commemorations, where a daughter of a donor contacted the anatomy department seeking ways in which she could find closure, found ways to manage her grief after the commemoration took place that honoured her father who was one of the donors from that year (49).

There is a growing body of evidence that proposes that families of donors do find some comfort from these commemorations in anatomy education. Families around the world report their deep gratitude for the services and express that observing how the bodies of their loved ones in anatomy are acknowledged acts as a great source of closure and encouragement (43, 49, 54).

However, there seems to be lack of insight when it comes to the perceptions of family members of donors towards the commemorations in anatomy education and what formatting trends assist them in gaining closure. Insight from this would allow room for these commemorations to ensure that family members of donors are benefiting in a way that reflects their needs in meaningful and ethical way.

d) Space where students can connect with the donor and the donor families

The literature suggests that speaking with families of donors after the ceremony provides students with a meaningful experience as they gain an insight into the life and personality of the donor (42, 43, 54). This is proposed to create a connection that stays with them throughout their careers thus reinforcing aspects of humanistic anatomy (42).

e) To serve as an outreach program

In 2012, the International Federation of Associations of Anatomists (IFAA) recommended that only donated bodies be used for anatomy teaching and research. Although many countries only acquire bodies through donation programs, there are still a large number of countries that rely on unclaimed bodies to utilise in anatomy education (34). Willingness of populations around the world are highly influenced by a multifactorial model: cultural customs, religion, socioeconomic status and level of education (13, 34, 73-77).

Countries such as Brazil (where the main source of bodies remains to be unclaimed bodies), have implemented strategies that serve as an outreach program to increase awareness of whole donation (44, 62, 78). The Anatomy Outreach Program was established in 2008, at the Federal University of Health Sciences of Porto Alegre, Brazil due to an increased need for bodies in anatomy education.

Da Rocha and colleagues have reported that the sole aim of the program was to increase awareness and education of the wider community about the possibility of donating one's body to anatomy education. The authors argue that the outreach program is a way in which the unethical use of unclaimed bodies in the country can begin to be rectified (78).

Within the outreach program however, there is incorporation of a commemoration known as an Ecumenical Ceremony. It is worth mentioning that several studies have reported an increase in body donation frequencies following the incorporation of commemorations in their anatomy curricula (45, 46, 79). The incorporation of commemorations in countries where reliance on unclaimed bodies is heavy, reflects ethical practice. Insight about changes in the frequencies of body donation in Brazil following this program would provide insight on the effectiveness of adhering to body donation program recommendations set by the IFAA (60).

## *2.2.02 Memorials*

While literature addressing the topic of commemorations in anatomy education is limited, literature addressing memorials in anatomy education is even more restricted. The purpose of memorials in anatomy education tends to serve the same purposes as that of commemorations in anatomy education. They are mainly put in place to express gratitude to past, present and future body donors and to offer a physical space for students and family of donors to commemorate the donors.

Reports on memorials in anatomy education existing have come from countries several countries including the Netherlands (41, 49, 50), China (46), and Spain (80). Because of the limited information on these memorials, each reported memorial from the above countries will be discussed.

### *Netherlands*

Kooloos and colleagues reported that the Department of Anatomy at the Radboud University Nijmegen Medical Centre (RUNMC) had a commemorative ceremony to unveil the memorial put in place at the institution, which took place on All Saints Day in 2009 (50). The design of this memorial was inspired by the first body donor memorial. This memorial was erected at the Yarden Crematorium Groningen, Netherlands in 2007. The RUNMC memorial was placed in close proximity to the university's Anatomical and Pathological Museums and was reported to be made of an old marble dissection table plate, with a sculpture of a phoenix fixed onto it. The phoenix is meant to represents arising of new life, and in this case new purpose and meaning, after death (50).

### *China*

It has been reported that the Red Cross Society has set up a total of 11 memorial gardens across China to commemorate body donors (46). The purpose of these memorials is to acknowledge the contribution these donors have made to medical knowledge and education. These memorials are the locations in which the annual commemoration for body donors take place (46). Furthermore, Zhang and colleagues, reported the existence of a commemorative website which is a web-based memorial service, where the donor family members and friends, students and academic staff can log into their respective memorial space where reflection through notes, songs, photos and other modalities can be electronically uploaded. The report seems to suggest that digital platforms to commemorate have been well received by all stakeholders of anatomy (46).

### Spain

The *Vitae Silva* (Life Forest) is a memorial put in place in Leia Campus of the University of the Basque Country, Spain (80). It is made from weathering-steel stems that are meant to mimic tree trunks and surround an ancient olive tree. Within each stem are secure compartments where the ashes of human remains are stored. The 'tree trunks' are connected by steel cables that produce a rustling sound with the presence of wind which is meant to produce a serene vibe (80). It is also reported that the memorial is open to the public during the day (80).

### United Kingdom

A memorial book was established in the 1960s in the Anatomy Department of Marischal College, University of Aberdeen, Scotland (81). A similar type of memorial, referred to as a 'Book of Remembrance' was established at the University of Glasgow in 1974. Both forms of memorials have names of donors and the dates of their death recorded (81). The memorial in Glasgow is displayed in the Museum of Anatomy and placed in a locked-glass top case containing an artificial red rose (81). The memorial book from Aberdeen, is maintained by academic staff, however reports on where it is displayed is unknown. Missing from the literature is information on whether the books are accessible to read by students or donor families. As well as this, information on how often the books are updated remains unknown.

In addition to the memorial book, there exists a memorial structure at Aberdeen's Trinity Cemetery, where several quotes are engraved on the monument with quotes of appreciation towards body donors (81), established in 1974. In addition to being a memorial, the site is also where donors' remains are buried and assigned plots. It has been reported that the memorial was established due to concerns voiced from donor families when there was an absence of a memorial. This is the first example seen where a memorial was erected due to concerns from donor families.

The newness of memorials in anatomy education is reflected by the limited literature around this area. It is clear that consultation from the stakeholders of anatomy is needed to ensure that memorials constructed in institutions serve the purpose they intend to.

## **2.3 Conclusion**

It appears that most of reports on of commemorations and memorials are descriptive in nature which was to be expected bearing in mind that these are novel phenomena in anatomy education. More analytical research is still to be produced. The rise of commemorations and memorials should be viewed as a reflection of the paradigm shift in the discipline. Therefore, there are many aspects yet to be investigated in this area. An important aspect seems to be consultation from the stakeholders of anatomy prior to the established of commemorations and the construction of memorials. This will ensure that the inclusiveness of these spectacles is maximised and thus amounting to well throughout and meaningful events. Studies investigating such matters, would allow room for consistencies in terminology to be established and justified.

### 3. METHODOLOGY

This was a questionnaire-based survey study. The cross-sectional study design was chosen over a longitudinal design for two reasons. Firstly, it enabled the attitudes of students at a given point of time to be explored. Secondly, this study design met the ten-month time frame allowed for the completion of this project within the second year of the Masters of Research (M. Res) program.

#### 3.1 Setting

This study was conducted at Macquarie University (MU) in the Faculty of Science and Engineering (FSE). The study focused on anatomy students at different levels of their education.

The FSE offers four undergraduate anatomy units (“unit” is a common term used in Australia to denote what is in other educational settings also termed as “module”; to avoid confusion the term “unit” will be used throughout this thesis). The first unit is, Introduction to Anatomy (HLTH108) that introduces students to basic concepts of gross anatomy, histology and embryology. HLTH108 is a prerequisite to the other three more in-depth regional anatomy units offered by FSE: Anatomy of the Limbs and Back (HLTH109), Anatomy of Head, Neck and Trunk (HLTH213), and Neuroanatomy (HLTH214).

Those four units are required to complete for students who undertake the Bachelor of Chiropractic Science (BChiroSci) or Bachelor of Human Sciences (BHumSci) degrees. Most of these students will further their education through the postgraduate degrees in Masters of Chiropractic Sciences (MChiroSci) and then possibly, Doctor of Physiotherapy (DPt). Anatomy units by FSE, are also available for other students to complete as electives, where majority of these students are enrolled in Bachelor of Medical Sciences (BMedSci) or Bachelor of Sciences (BSci) degrees. Students from these courses will often continue their education in an allied health course or research.

HLTH108 is also a prerequisite for the anatomy units offered through the Faculty of Medicine and Health Sciences (FMHS) at MU. These units are specifically catered for the Bachelor of Clinical Sciences (BClinSci) degree, where most of these students will further their education in medicine, physiotherapy or research. The BClinSci degree was developed recently in 2016, where students complete a traditional three-year undergraduate degree in an intensive two year-program of studies. Consequently, all units are fast-tracked and run at different times during the year.

Anatomy related units for BClinSci include: Cardiorespiratory 1 (MEDI201), Renal and Alimentary 1 (MEDI202), Musculoskeletal 1 (MEDI203), Neuroscience 1 (MEDI204), Cardiorespiratory 2

(MEDI301), Renal and Alimentary 2 (MEDI302), and Neuroscience 2 (MEDI303). All of these units include both anatomy and physiology.

All anatomy units have six contact hours per week, comprising of three hours of lectures, two hours of laboratory practicals and one hour of classroom tutorials. Human cadavers are not used in teaching at the introductory anatomy level. Thus, in HLTH108 all practical work is carried out in general purpose laboratories utilising anatomical models and digitalised histological slides. In contrast, the practical component for all higher-level anatomy units (HLTH109, HTH213, HTH214 and all MEDI) include inspection of prosected human cadavers in the anatomical regions relevant to the content of each unit. In spite of the availability of donated bodies, none of the undergraduate programs in Australia teach anatomy through dissections (82). Similar to other tertiary institutions in the country, anatomy at MU is taught to undergraduate students exclusively through the inspection of prosected bodies.

### 3.2 Target Population

In order to answer the research question, three groups were targeted for this study:

- 1) **No Exposure:** Anatomy students who were not exposed to human remains during their laboratory practicals (G1).
- 2) **Current Exposure:** Anatomy students who were currently undertaking a unit that had a cadaver laboratory component (G2).
- 3) **Post-Exposure:** Past anatomy students who have completed all anatomy units that require the cadaver laboratory (G3).

Table 3.1 summaries the three groups mentioned above and their corresponding units and the degrees offering these units.



Group	Unit	Degrees offering these units
G1	HLTH108	BChiroSci, BHumSci, BMedSci, BSci, and BClinSci
G2	HLTH109	BChiroSci, BHumSci, BMedSci, and BSci
	HLTH213	BChiroSci, BHumSci, BMedSci, and BSci
	MEDI303	BClinSci
G3	-	MChiroSci

**Table 3.1: Student groups and corresponding units**

### **3.3 Development of Questionnaire and Participant Information and Consent Form (PICF)**

The questionnaire was developed using guidelines from the Association for Medical Education in Europe (83). Overall, it consisted of twenty-eight items, and was divided into 2 parts. The first part of the questionnaire consisted of eleven items, collecting general information such as age, gender, ethnicity, religion, etc. Phrasing of the questions related to demographic information and examples provided were adapted from the Australian Bureau of Statistics (84).

The second part of the questionnaire consisted of seventeen items. It was used to collect information about commemorations and memorials in anatomy education. Questions for this part of the questionnaire were synthesised based on a literature overview done prior to the development of the questionnaire. At the beginning of the second part, a summary and background of the project was provided to participants which consisted of less than one-hundred words that provided a succinct summary background of the topic and purpose of the project. The questionnaire consisted of single and multiple answer as well as open-ended questions (Appendix 8.1).

The Participant Information Consent Form (PICF) was developed following the MU Human Research Ethics Committee (HREC) preparation guidelines for information/consent forms. Since the study was anonymous, written evidence of participants' consent was not needed and

therefore, that section of the MU PICF framework was not included. See Appendix 10.2 for the PICF used in this study.

The questionnaire was tested and validated, before being used for the present study, using the following: 1) four senior anatomy academics, 2) three senior anatomy tutors, 3) six non-anatomy academics, and 4) five past anatomy students (who are not enrolled in the MChiroSci and therefore were not included in the study). All people in the groups asked to validate the questionnaire had some form of past or present cadaver-based anatomy experience. Validation consisted of a review of the appropriateness of the questions and its wording.

### **3.4 Ethics Approval**

The Macquarie Human Research Ethics Committee granted ethics approval to the project on 17<sup>th</sup> May, 2018 (reference number: 5201800248) (Appendix 8.3).

### **3.5 Data Collection**

Data collection for students who were enrolled in HLTH108, HLTH109, or HLTH213 took place at the beginning of a compulsory practical session, aiming to get more students to participate in the survey. Data collection for students in MChiroSci (G3) and BClinSci (G2) took place during classes where attendance was also compulsory.

Each potential participant was given a printed copy of the PICF and the questionnaire. Although outlined in the PICF, participants were also informed verbally that participation was completely anonymous and voluntary. The questionnaire took approximately 10-15 minutes to complete.

### **3.6 Statistical Analysis**

Data entry was completed using Microsoft Office Excel 2013. All statistical analysis of the data, including descriptive statistics, was carried out in the statistical software package, Minitab version 18. Pie and bar charts were used to illustrate categorical variables in the data and explore associations between categorical variables. Chi-square test of independence was used to ascertain the associations. One-way Analysis of Variance (ANOVA) was used to compare a continuous

variables (e.g. age) across categories of each main outcome variable studied, to evaluate their association.

### **3.7 Conflict of Interest and Risk of Bias**

The author of the thesis is an anatomy tutor and has taught some of the potential participants.

Therefore, to avoid risk of bias and negate any pressure for students to participate, the author was not present while the questionnaire was distributed and completed.

## 4. RESULTS

### 4.1 Characteristics of respondents

A total of 1051 students were invited to partake in this study, out of which 756 (71.9%) participated in the study. Twenty-two out of the 756 participants were excluded from the analysis since they were under 18 years of age, the cut off for the current study. As a result, the final response rate was 69.8% (734 out of 1051). The response rates for the three groups studied are given in Table 4.1.

Group	Number of students enrolled	Response Rate
<b>G1- No Exposure</b>	581	407 (70.0%)
<b>G2- Current Exposure</b>	322	215 (66.8%)
<b>G3- Past Exposure</b>	148	112 (75.7%)
<b>Total</b>	<b>1051</b>	<b>734 (69.8%)</b>

**Table 4.1: Summary of responses for each group**

Among the 734 respondents included in the study, age ranged from 18 to 52 years, with average age of 20.7 (SD = 4.1) years. In terms of gender, 51.8% were male (n=380), 47.3% were female (n=347), 0.7% indicated they were other (n= 5) and two respondents did not indicate their gender. For ethnicity, responses were categorised in 4 broad groups: 'Australian', 'Non-Australian', 'Mixed' and 'Unknown'. Respondents who were Aboriginal and Torres Strait Islander or Australian were placed in the Australian group.

Non-Australians were further divided into 9 categories based on the Australian Standard Classification of Cultural and Ethnic Groups (85) (Appendix 8.4): Oceanian, North-West European, Southern and Eastern European, North African and Middle Eastern, South-East Asian, North-East Asian, Southern and Central Asian, People of the Americas, and Sub-Saharan African. The 'Mixed' group included respondents who listed more than one (1) ethnicity, and the 'Unknown' group included all respondents with a missing response on the ethnicity question. The ethnicity patterns of the 734 participants are shown in Table 4.2. As expected, the largest group was Australian (35.1%), with North-East Asian (13.9%) being the second largest group.

Ethnicity	Count	% of Total
Australian	258	35.1
Mixed	70	9.5
North-West European	48	6.5
North African and Middle Eastern	46	6.3
North-East Asian	102	13.9
Oceanian	20	2.7
People of the Americas	13	1.8
South-East Asian	65	8.9
Southern and Central Asian	44	6.0
Southern and Eastern European	50	6.8
Sub-Saharan African	15	2.0
Unknown	3	0.4
Total	734	100.0

**Table 4.2: Ethnicity summary of respondents**

With regard to religious orientation respondents were classified into 3 groups in this study: 'Religious', 'Non-Religious', and 'Unknown'. Any response indicating a religion or system of belief listed on the Australian Standard Classification of Religious Groups was placed in the 'Religious' group (Appendix 8.5). Respondents that indicated they were Atheist or Agnostic were placed in the 'Non-Religious' group. Responses that were classified in the 'Unknown' group included missing responses for that question. Results revealed that 58.9% of respondents were religious (n =432), with Christianity being the most common religion (76.9%, 332 out of 432). There was 40.6% (n=298) of the 734 respondents considered non-religious, and 0.5% of responses were unknown (n=4).

Majority of the respondents were domestic students (93.3%, n= 685), where 6.3% of the respondents were international (n=46), and 0.4% of respondents did not indicate their student mode (n=3).

In regard to body donation, 34.9% of the respondents in the study agreed that they would consider donating their bodies to medical education (n=256), where 26.0% indicated they would not (n=191), and 39.1% of responses were unknown (n=287), where the 'unknown' referred to unanswered (i.e., missing response) or undecided.

## 4.2 Commemorations and Memorials Main Outcome

Among the 734 students included in this study, majority of them (76.3%; n=560) agreed that a commemoration (a ceremony that honours the body donors) should be established at Macquarie University (MU) (Figure 4.1). In addition, majority of the respondents in the study (73.6%; n=540) had an attitude in favour of building up a memorial for body donors (Figure 4.1). The unknown group included those undecided or with missing answers for that question.

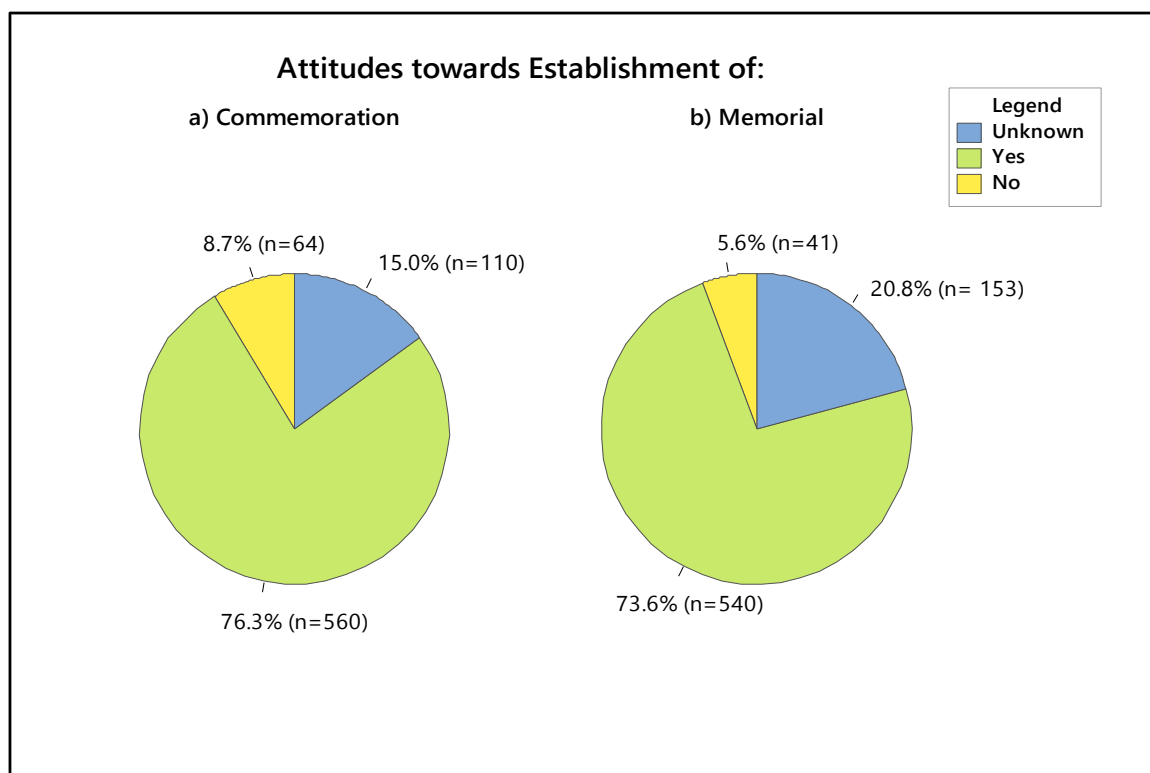


Figure 4.1: Attitudes towards commemoration and memorial establishment in anatomy education

## 4.3 Associations between attitudes towards commemorations and characteristics of respondents

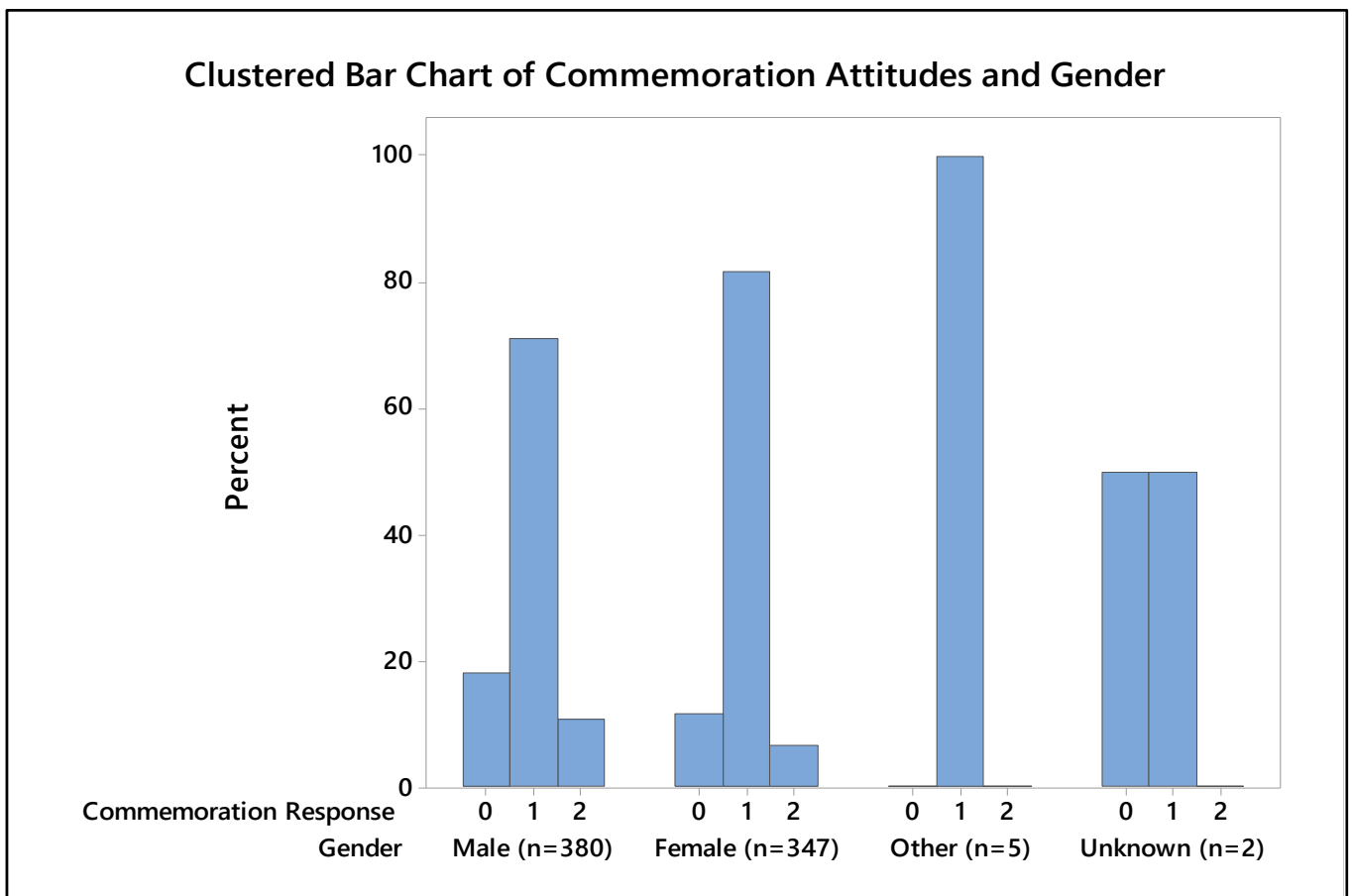
### 4.3.01 Age

There were 560, out of the 734 students participated, who expressed support for establishing a commemoration in anatomy education at MU with an average age of 20.6 years (SD = 4.03; ranging from 18 to 52 years). The students who did not support the idea of a commemoration (n=64) had an average age of 21.2 years (SD = 4.88; ranging from 19 to 43 years). Those students with 'unknown' response (n=110) had an average age of 21.1 years (SD = 3.95; ranging from 19 to

35 years). Based on the F-test from ANOVA, the p-values for all three possible responses regarding commemorations did not show significant differences ( $p > 0.05$ ).

#### 4.3.02 Gender

Figure 4.2 shows that females were more likely to say 'yes' (81.8%) relative to males (71.1%). The difference between males and females was statistically significant ( $p = 0.003$ ) based on a chi-square test. The number of students that were unknown ( $n=2$ ) or indicated 'other' ( $n=5$ ) for gender were too low and thus not included in the test.



**Figure 4.2: The influence of gender on attitudes commemorations: Support for commemoration: 0 = Unknown, 1= Yes, 2= No.**

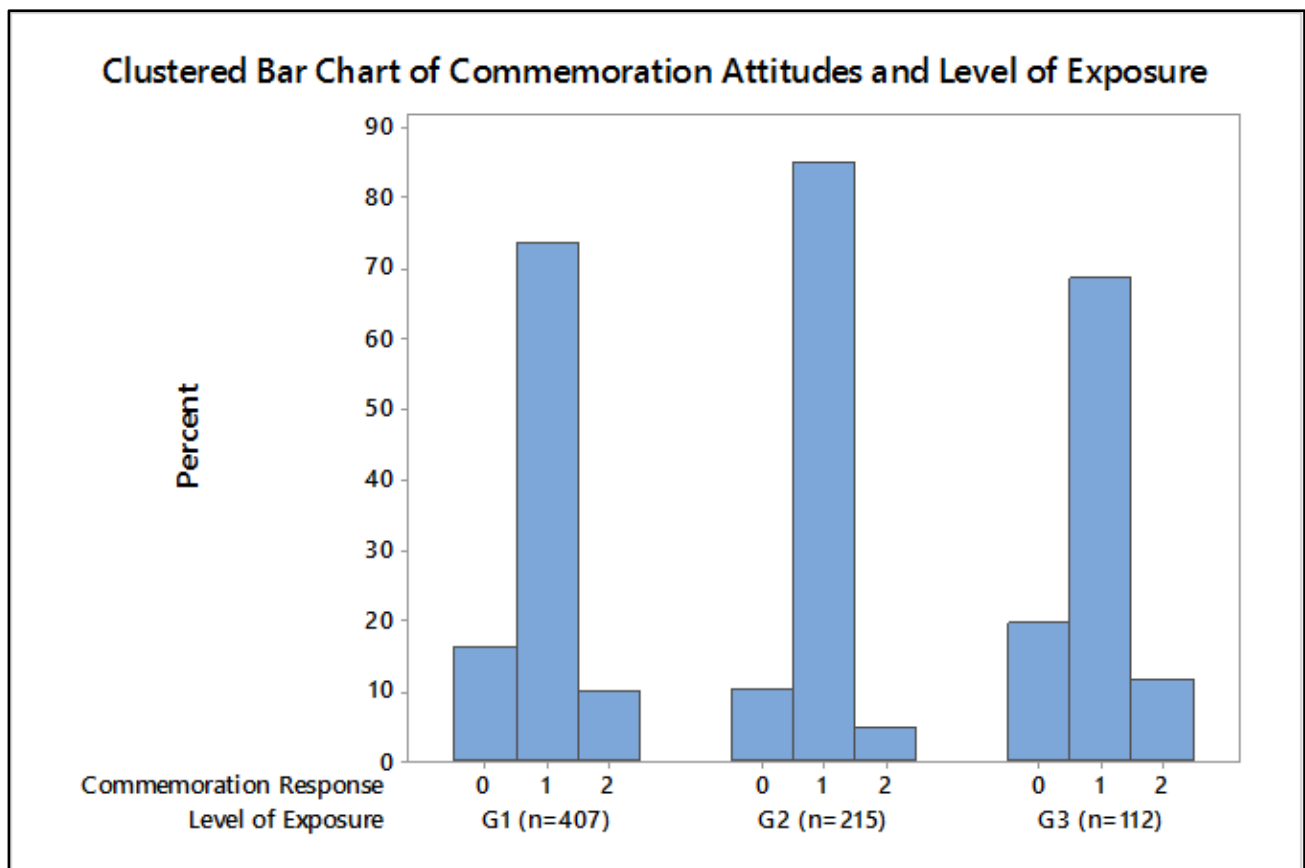
#### 4.3.03 Ethnicity and Religion

The support for a commemoration in anatomy education was similar across the all ethnicity groups ( $p > 0.05$ ) as shown in Appendix 8.6 (Figure 8.1). There was no significant difference in attitudes towards commemorations (see Appendix 8.6, Figure 8.2) between religious and non-

religious respondents ( $p > 0.05$ ). The 'unknown' group with only a very small number (4) students was excluded from the relevant statistical test performed.

#### 4.3.05 Level of Exposure

Participants who were exposed to human remains (G2), at the time the study expressed the highest level of support to establish a commemoration in anatomy education (85.1%), as shown in Figure 4.3. The difference in support across the three levels of exposure was statistically significant ( $p < 0.05$ ), according to the chi-square test.

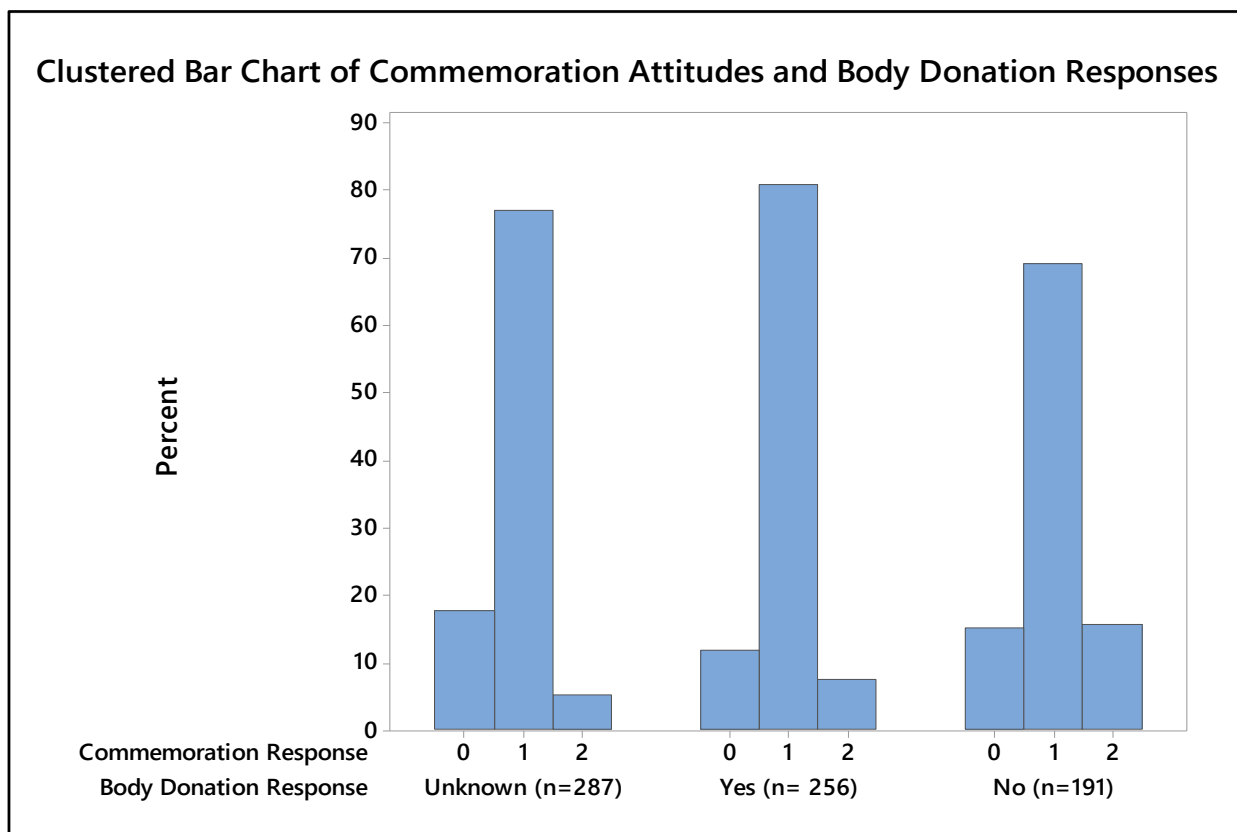


**Figure 4.3: The influence of level of exposure on attitudes towards commemorations. Support for commemoration: 0= Unknown, 1= Yes, 2= No. G1 = Anatomy students who were not exposed to human remains during their practical, G2 = Anatomy students who were currently undertaking a unit that had a cadaver laboratory component, G3= Past anatomy students who have completed all anatomy subjects that require the cadaver laboratory.**



#### 4.3.06 Body Donation

A positive attitude towards body donation was associated with support for a commemoration in anatomy education ( $p < 0.05$ ), suggesting support to establishing a commemoration in anatomy education at MU was different across groups of students with different attitude towards body donation (Figure 4.4).



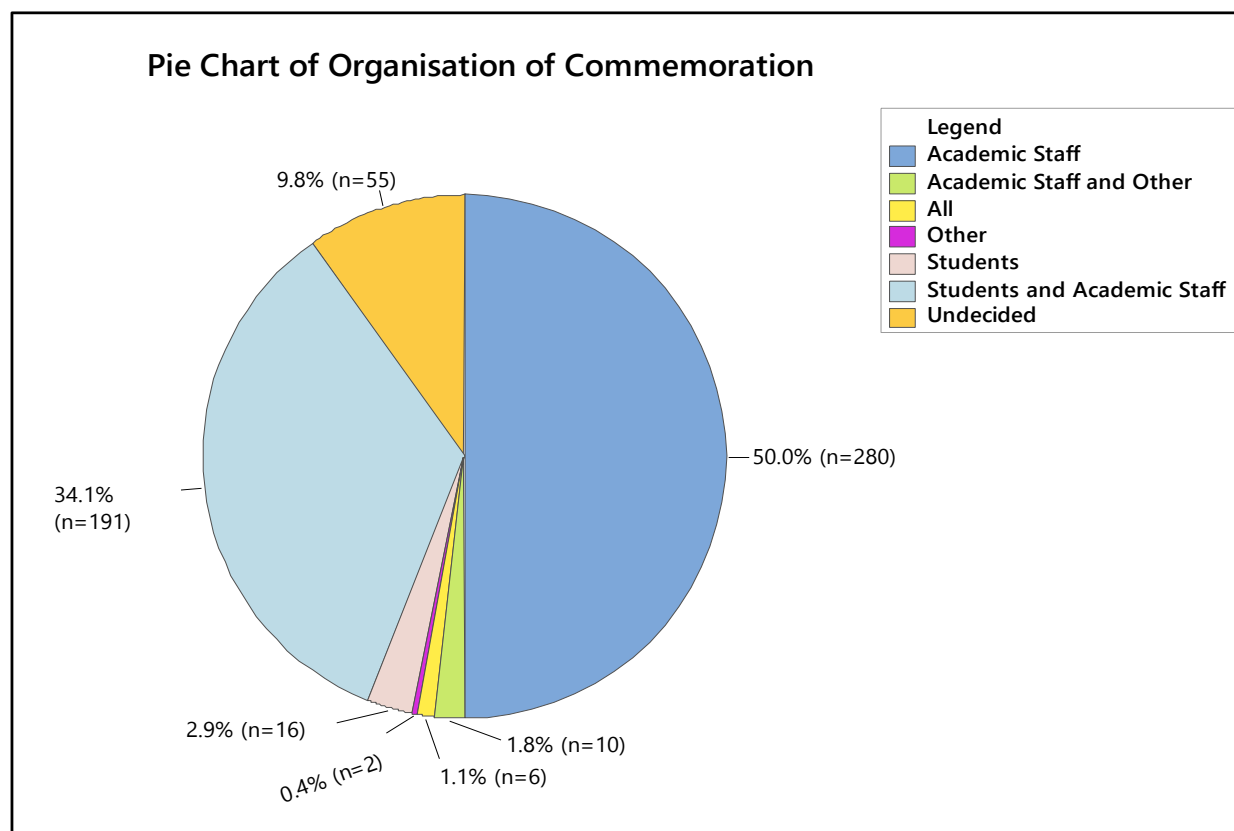
**Figure 4.4: The influence of body donation response on attitudes towards commemorations. Support for commemoration: 0= Unknown, 1= Yes, 2= No.**

### 4.4 Format of Commemoration

#### 4.4.01 Organisation of Commemoration

As shown in section 4.2, there were 560 students who agreed that an anatomical commemoration should be established at MU. Of them, half (50.0%) of participants preferred academic staff alone to organise the event (Figure 4.5). Having students jointly with academic staff to organise the event was the second most common response (34.1%). There was no statistically significant difference in the preference for organising the commemoration event between males and females ( $p > 0.05$ ), across ethnicities ( $p > 0.05$ ) or religions ( $p > 0.05$ ), based on chi square tests.

However, analysis revealed that level of exposure to human remains was associated with the preference in the organisation of commemoration ( $p < 0.05$ ).



**Figure 4.5: Responses for organisation of commemoration**

#### 4.4.02 Attendance and Frequency of Commemoration

Table 4.3 summarises the students' attitudes towards each stakeholder in anatomy attending the commemoration.

Response	n out of 560 (%)
<b>Anatomy Staff</b>	519 (92.7%)
<b>Anatomy Students</b>	499 (89.1%)
<b>Donor Families</b>	490 (87.7%)
<b>Future/Potential Body Donors</b>	350 (62.5%)
<b>University Management</b>	295 (52.7%)
<b>Local Government Bodies</b>	203 (36.3%)
<b>Other</b>	17 (0.03%)
<b>Media</b>	135 (24.0%)

**Table 4.3: Summary of attendance responses**

The most preferred option in regard to how often the commemoration should be carried out was 'once a year' (65.5%), followed by 'twice a year' (13.9%), while 20.5% of responses were unknown. More than half of participants agreed that students should attend a commemorative event before entering the anatomy laboratory (57.7%, n=323). 34.6% of students expressed that students should attend after finishing all units that require the anatomy laboratory (n=194). The remainder of the responses were 'other' (4.1%, n=23) or unknown (3.6%, n=20).

#### *4.4.03 Community Representation*

In regard to the presence of religious representatives, 50.0% (n=280) of respondents felt that the commemoration should be secular (Appendix 8.6 – Figure 8.3). Religious status did not make a difference to attitudes towards the presence of a religious representative at a potential commemoration according to a chi square test Appendix 8.6 – Figure 8.4) ( $p > 0.05$ ). According to community representation, 51.4% of students agreed that there should be Aboriginal and Torres Strait Islander representation at the commemoration (Appendix 8.6 – Figure 8.3). The ethnicity of the respondents did not influence this attitude according to the chi square test ( $p > 0.05$ ) (Appendix 8.6 – Figure 8.5).

#### *4.4.04 Social Media, Modalities and Reveal of Identity*

Of the 560 participants who agreed that a commemoration should be established in anatomy education at MU, more than half (n= 329, 58.8%) reported that a potential commemoration should not be recorded for social media. with 25.2% reporting that it should (n=90) and remainder of responses being unknown i.e. unanswered or missing responses (n=141, 25.2%).

Regarding presence of artistic performances at a potential commemoration, 189 out of the 560 of participants (33.8%) agreed with this notion, while 34.1% did not (n=191) and 32.1% of responses regarding that question were unknown i.e. unanswered or missing responses (n=180). As for the presence of symbolic objects, 386 out of 560 (69.8%) agreed with this idea, while 10.5% did not (n=59) and the remainder of responses were unknown i.e. unanswered or missing responses (n = 115, 20.5%).

285 out of the 560 students agreed that the reveal of the identity of donors with consent from family members should be revealed at a potential commemoration at MU (50.9%), while 25.9% of students did not think identities should be revealed (n=145), and 23.2% of responses were unknown i.e. unanswered or missing responses.

## 4.5 Support for Memorials by the Characteristics of Respondents

### 4.5.01 Age

For the 540 out of 734 students who expressed support for building up a memorial for body donors at MU, the average age was 20.6 years (SD = 4.01), ranging from 18 to 52 years. The students who did not support the idea of a commemoration (n=41) had an average age of 21 years (SD = 3.8), ranging from 18 to 34 years. Those with unknown response on support for establishing a memorial (n=153) had an average age of 21.2 years (SD = 4.5), ranging from 19 to 43 years. Based on the F-test from ANOVA, the p-values for all three possible responses regarding memorials did not show significant differences ( $p > 0.05$ , p value = 0.331).

### 4.5.02 Gender

Figure 4.6 shows that females were more likely to say 'yes' (79.5%) relative to males (67.9%). The difference in male and female was statistically significant ( $p = 0.002$ ) based on a chi-square test. Note that, the number of students that were unknown or indicated 'other' for gender were too low (n=2 and 5, respectively) and thus not included in the test.

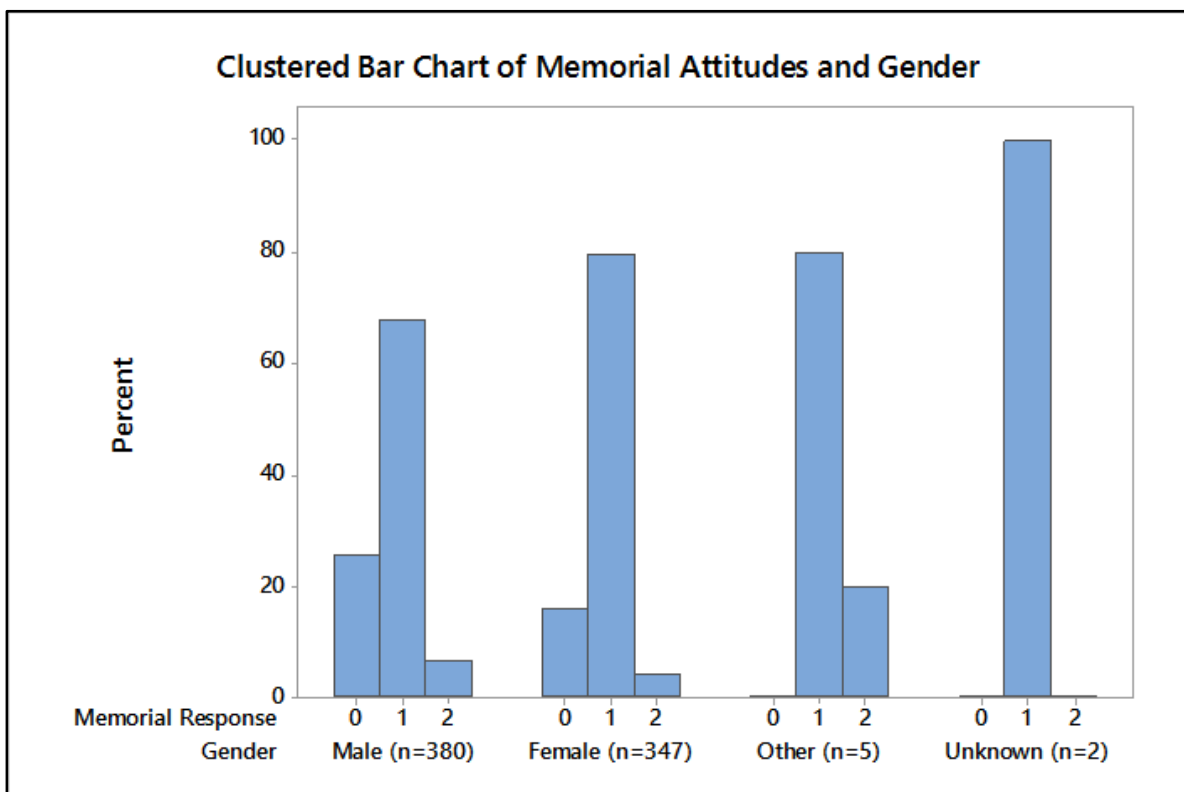


Figure 4.6: The influence of gender on attitudes towards memorials. Support for memorial: 0= Unknown, 1= Yes, 2= No.

#### *4.5.03 Ethnicity and Religion*

The support for a memorial in anatomy education at MU was similar across all ethnicity groups as shown in Appendix 8.6 - Figure 8.6, and confirmed by a chi square test ( $p > 0.05$ ). Similar patterns were seen in terms of support for a memorial in anatomy education across all groups of religion ( $p > 0.05$ ), although the number of students in unknown group was too small ( $n=3$ ) and thus not included in the relevant statistical test (Appendix 8.6 - Figure 8.7).

#### *4.5.05 Level of Exposure*

Figure 8.8 (Appendix 8.6) shows that participants, who were exposed to human remains at the time the study, expressed the most support (80.5%). The difference between the three levels of exposure was statistically significant ( $p < 0.05$ ).

#### *4.5.06 Body Donation*

Figure 8.9 (Appendix 8.6) shows that positive attitude towards body donation was associated with support for a memorial in anatomy education at MU, i.e., there is a significant difference in the supporting rate between the three responses groups of body donation ( $p < 0.05$ ).

## 5. DISCUSSION

The aim of this study was to investigate students' attitudes towards commemorations and memorials in anatomy education at an institution which still has not introduced either of these. The primary aim was to investigate whether students would be in favour of establishing a commemoration and/or a memorial. In addition, the study focused on students' preferences of the format of a potential commemoration. The project also explored several characteristics of the respondents which could have influenced their attitude towards commemorations and memorials and the preferred format in which they should be organised.

It was hypothesised that majority of students would be in favour of establishing both a commemoration and building a memorial at Macquarie University (MU). This hypothesis was corroborated as 76.3% of the students were in favour of commemorations and 73.6% in favour of memorials, both considerably above the majority. These results are in line with the only previous project which asked a similar question – a study conducted at University of Novi Sad, Serbia, another institution in which neither commemoration nor a memorial in anatomy has been established yet (86). While the primary aim of that study was students' attitudes towards body donation, they were also asked if they would support the introduction of anatomy commemoration in their anatomy program at their university. The majority of students, who belong to various programs (medicine, dentistry, pharmacy, physician assistant studies, physiotherapy and special education and rehabilitation) were in favour of organising commemorations for body donors at their place of study (86).

Many studies over recent years have underscored the need to adopt humanistic treatment of human cadavers in anatomy curricula, suggesting that a 'patient-centred' approach, which characterises modern medicine, should initially be shaped in the anatomy laboratory (1, 8, 20, 87). As the 'first patient', or 'silent teacher' model dominates the way in which students and educators treat human remains, it is evident that this paradigm shift is well in place in many modern anatomy curricula (7, 12, 53, 88).

The positive attitudes expressed by students from this study towards incorporating anatomical commemorations and memorials justifies not only their introduction, but also reinforces the humanistic approach. This is further reiterated by similar attitudes expressed in the study discussed above (86), as well as positive feedback that has been reported about existing

commemorations and memorials from many different institutions, by all stakeholders of anatomy (12, 44, 49, 53).

Conversely, the unknown responses that were expressed for both commemorations (15.0%) and memorials (20.8%), highlight a need for anatomy educators to perhaps be more transparent of the humanistic model to align, engage and educate students on such matters.

In addition, it was hypothesised in the current study possible differences in attitudes towards commemorations as well as their format and structure would be influenced by ethnicity, religion and level of exposure to human remains. The hypothesis that attitude differences on commemoration will be influenced by ethnicity and religion seems to be falsified within the Australian context, as there were no significant differences in answers with regards to these two characteristics. However, attitudes seemed to be influenced by gender, level of exposure to human remains and attitudes towards body donation. All these variables and their possible role will be explored in the sections below.

## **5.1 Religion**

The influence that religion has on attitudes towards commemorations and memorials in anatomy education has not been previously investigated. However, it has been suggested in several studies that religion plays a prevailing role in what perceptions are formed, in relation to certain aspects of anatomy (77, 89-91). Significantly, attitudes towards body donation seem to be influenced by the religion (77, 89-91). This is not surprising as religion, whether in form of belonging to a recognised religious group or merely accepting postulates of spiritual philosophy seem to shape individuals' general outlook of life and death including the perceptions of dead people and their treatment (92, 93). Several studies have suggested that atheists are more likely to donate their bodies for anatomical study relative to religious persons (75, 77, 94-97). Significantly, two of the studies that suggested the influence of religion to body donation were conducted at the same institution as the current study (MU) and targeted similar groups of students (77, 97).

This is also to be expected as many religions have highly prescribed and ritualised process of handling the dead in order to achieve afterlife rewards (92, 93). However, it should be noted that religious vs. atheist dichotomy is an oversimplification as the influences behind the attitudes towards body donations are always multifactorial and religious attitudes are often modulated by

other variables, such as education (41, 48, 49, 53, 76, 77, 86, 90, 91, 95, 96, 98, 99). Furthermore, it has been shown that in some cultures, religion can provide incentives for body donation (7, 12).

Bearing in mind the differences in attitudes towards body donation, it was hypothesised that there will be similar differences in attitudes towards commemorations and memorials between students who identified as religious relative to non-religious students. Results revealed that there were no such differences as both religious and non-religious students had positive attitudes towards establishing a commemoration and/or a memorial construction in anatomy education at MU. The respect for body donors, the acknowledgement of the importance of their altruistic acts for education and, consequently, the need to honour them, were accepted by the majority of students as universal values, irrespective of students' personal beliefs, whether religious, atheistic or agnostic.

It is promising that similarities between religious and non-religious students is a reflection and acceptance of the humanistic approach that characterises many modern anatomy curricula and plays an important role in shaping healthcare professionals of the future.

The presence and involvement of religious representatives at many commemorations worldwide, has been noted in several studies (12, 19, 29, 50, 88). To date, there has been no research into students' attitudes towards religious representation in commemorations in anatomy education, an issue particularly important in multicultural societies such as Australia. This study revealed that majority of students, regardless of religion or lack of would prefer the commemoration to be secular. This could be a result of acknowledgment of cultural diversity in the modern Australian society and the appreciation of minorities and people with different worldviews, particularly within the educated sector (100). In addition, these findings provide further support for the humanistic shift that the modern anatomy classroom reflects. Students understand that the commemoration would be put in place not to impose any burial or death rituals but to celebrate the gift of body donation.

Future investigations into this aspect of commemorations and memorials in anatomy education should aim to explore the role of religion in anatomy education further, using more comprehensive questionnaires, focus groups and interviews.



## 5.2 Ethnicity

The Australian Standard Classification of Cultural and Ethnic Groups (ASCEG) definition of ethnicity was utilised in the development of the questionnaire and this thesis (85). These definitions are used in obtaining and analysing census data.

Similar to religion, previous research exists to suggest that ethnicity plays an important role in the formation of perceptions about various aspects of anatomy. Body donation is the aspect shown to be influenced by ethnicity (13, 34, 41, 48, 68, 75-77, 80, 86, 90, 91, 94-96, 101, 102). Differences in attitudes towards body donation are to be expected when such diversity around social and cultural customs around death and burial rituals exist (93).

A study conducted in the same institution (MU) as this study, investigated students' attitudes towards whole body donation. The authors found that students of Australian ethnicity were more willing to bequeath their bodies to medical education relative to their non-Australian peers (77). However, an international survey of body donors revealed that ethnicity influenced attitudes towards body donation in South Africa, and did not in Ireland and New Zealand (95). However, ethnicity alone does not influence perceptions, rather, it is agreed that, it is one factor in a multifactorial model that influences these perceptions (51, 77, 95). As discussed above, religion, level of education and socioeconomic status as well as ethnicity influence the attitudes that are shaped towards these topics (45, 74, 76, 77, 79, 96).

For this part of this study, it was hypothesised that ethnicity would influence attitudes towards establishing commemorations and building memorials in the anatomy program at MU. Results did not seem to support this hypothesis. Therefore, similar to religion, it appears that irrespective of ethnicity and cultural traditions, students universally recognise the need to express gratitude to donors for their contribution to students' education.

Perhaps, through this contribution to ones' education, the layers that profile an identity such as ethnicity, are layers that are shed away metaphorically and simultaneously with the physical reflection of the epidermis. Therefore, better knowledge and increased awareness of benevolent approaches in medicine and anatomy seem to make individuals more likely to transcend the cultural boundaries and accept as well as promote humanistic values.

However, although there were no differences found in what attitudes were shaped towards potential commemorations and memorials, anatomy educators should remain vigilant and acknowledge that there is indeed diversity in the way that ethnicities view death and dead bodies (29, 32, 34, 41, 49, 56, 73, 92, 93, 103). Anatomy educators should adopt a broad enough approach accommodates and includes all ethnicities (77). This applies in the context of the anatomy laboratory, as well as the way commemorations and memorials are approached.

There is lack of evidence on the role of an Aboriginal and Torres Strait Islander representative plays in Australian commemorations in anatomy education. It is vital that this is investigated in to provide insight on how commemorations in Australian universities should be conducted so that a purposeful and ethical event is the result of such investigations.

Several authors have noted that in institutions where there is involvement of indigenous communities, there is more often a community or cultural representative present at the commemoration of that institution. (52, 54). For example, in the University of Otago, New Zealand, the *whakawātea* (clearing of the way) ceremony is conducted by a Kaumātua elder, where the ceremony is open to both students from the Māori culture and other cultures (52, 54).

Keeping in mind the reported presence of such representatives (52, 54), it was hypothesised that students' would express a positive attitude regarding the presence of an Aboriginal and Torres Strait Islander representative at a potential commemoration at MU – an Australian institution. Results supported this hypothesis, with around half of respondents supporting this notion (51.4%). These findings perhaps highlight that students are inclined to acknowledge Aboriginal culture and history as their education takes place on Aboriginal land (104).

In the Australian context, future investigations should explore perceptions of all Aboriginal and Torres Strait Islander communities towards body donation in anatomy education, as well as perceptions towards commemorations and memorials in anatomy. Flourishing a body of evidence around indigenous representation in anatomy education will enhance relations between anatomists and indigenous communities.

### **5.3 Gender**

It was hypothesised that there would be no gender differences in supporting the establishment of a commemoration and constructing a memorial at MU. The findings falsified this hypothesis,

highlighting that females were more inclined to be in support of such notions. Perhaps, the area of anatomy where gender differences are worthy of mention is the expression of emotions towards the process of work with cadavers (69, 70, 72, 101, 105). Studies in psychology revealed that women generally with the exception of anger, express emotions more intensely and more frequently than men (106-111). It could be argued, following these findings, that female students would feel more open to express gratitude to body donors in a setting such as a commemoration, then their male counterparts.

This could also explain why males had a higher 'no' and 'unknown' response relative to their female peers (Figure 4.3), in that having a social function such as a potential commemoration or memorial, where expression of gratitude occurs may have been an uneasy concept to agree.

However new ideas on human diversity are starting to dominate public discourse and replace the reductionist view of the men vs. women dichotomy. More research is needed around how and if gender differences are polarised in what attitudes are shaped towards commemorations in anatomy education. It is also important that future studies that explore such matters, are also inclusive of students who are gender diverse (i.e. 'transgender', 'non-binary' and 'other') so that insight is gained on both majorities and minorities and thus the experience in the anatomy laboratory and a potential commemoration and memorial are inclusive of everyone.

## **5.4 Level of Exposure**

Empathy features prominently among the desired qualities of a humanistic physician (1, 112). In the context of medical education, empathy is defined as "a cognitive attribute that involves an ability to understand the patients' inner experiences and perspective and a capability to communicate this understanding" (113). It has been suggested that in an attempt to deal with emotional challenges of work in the anatomy laboratory, students detach from cadavers, treat them as "specimens" and through that process, begin to lose their innate empathy when they are exposed to human remains (69, 112). The loss of empathy is said lead to the passive treatment of the human cadaver and potentially catalyses the conception of the detached concern towards future patients (69, 114).

Students that participated in this study were categorised into three groups relative to their exposure to human remains in their anatomy education at MU: 1) No Exposure (G1), 2) Current Exposure (G2) and, 3) Post-exposure (G3) (the full description of each group is given in Table 3.1).

It was hypothesised that since, G1 had no affiliations with human cadavers, they would be less inclined to support establishment of a commemoration and constructing a memorial at MU, relative to students who have had exposure to human cadavers i.e. G2 and G3. It was conjectured that the two latter groups would understand the importance of body donation for anatomy and the need to show appreciation for this ultimate act of altruism.

Findings did not support this hypothesis. Results revealed that students in G2 indeed expressed the most support, however students in G3 expressed relatively more negative attitudes towards both commemorations and memorials, and also had the highest unknown response.

Students who were exposed to human cadavers at the time the study was conducted (G2), felt that it was important to incorporate commemorations and memorials in the anatomy curriculum which suggests two things: 1) expression of empathy and 2) reflection of the experiences had in the anatomy laboratory.

This is perhaps a result of the paradigm change in anatomy education - embodied in the humanistic approach, which is strongly advocated and implemented at MU. This approach was seen as the best practice in medical/health professions education as studies suggest that the treatment of human cadavers in the anatomy laboratory parallel the way in which students deal with future patients (7, 8, 13, 17). Moreover, it is proposed that pre-clinic years foretell the way in which students deal with experiences of death and dying (49, 56). It is therefore vital that during these pre-clinical years, particularly in anatomy, students strengthen their ability to approach distress and adopt coping strategies related to exposure to death and dying.

Hence, it can be argued that the paradigm shift in anatomy education increases self-reflection and reinforces empathy (103), and thus as a consequence, students become inclined to express positive attitudes towards the phenomena that are commemorations and memorials.

However, results from this study suggest that perhaps some of the empathetic drive might be lost after students are no longer exposed to cadavers (G3). This may be due to the time gap since students have been exposed to human remains, or, simply the empathy is now expressed more towards the patients these students start to encounter in their everyday studies. The findings from this study, pertaining to G1, also suggest that empathy may not extend beyond the line of sight.

Commemorations and memorials in anatomy education may serve as a way to bridge and delay this time gap. Through this, a bond is formed and strengthened and thus as a consequence, students become ethical life-long humanistic learners. Da Rocha and colleagues, reiterate this

concept in their recent study where results revealed that 100% of family members of donors, agree that a commemoration incorporated in anatomy curricula was pivotal in the ethical training of students (62). Furthermore, the study reported that the commemoration encouraged students to reflect on ethical issues as well as a heightened sense of commitment and responsibility regarding their own learning (62). The theme of heightened responsibility and reflection is also highlighted in other studies in anatomy education all of which emphasise the importance of the humanistic approach (12, 29, 53, 88).

## **5.5 Body Donation**

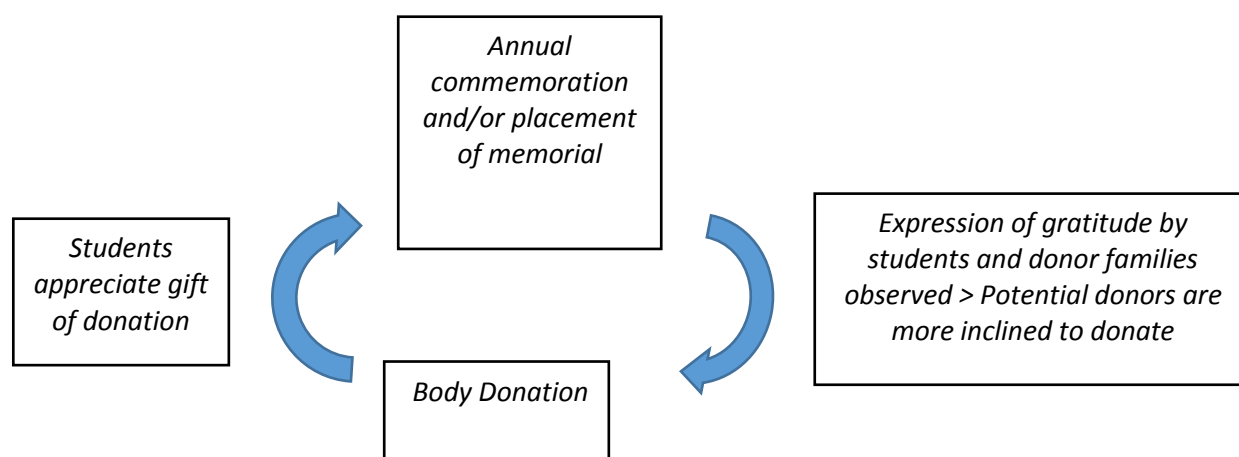
There are many reasons as to why commemorations are established in anatomy education or why memorials are erected. One reason that perhaps encapsulates all other reasons is to demonstrate respect to those whose bodies were used in anatomy education (12, 19, 63-65).

In this study, the hypothesis around this was that students who expressed a positive attitude towards body donation would express a positive attitude towards commemorations and memorials in anatomy education. Results supported the hypothesis, however, the findings highlighted the large number of students who were unsure about their attitude toward body donation which suggests concern and perhaps lack of education.

Guidelines on establishing ethical and successful body donation programs have now incorporated the need for some form of space and/or event that can take place in order to provide avenues for students to express gratitude towards donors (51). In fact, a number of universities in countries such as China (45, 46, 68) and Korea (48), have experienced a rise in body donations since implementing 'donor-appreciation' ceremonies (48). This proposes that commemorations and memorials successfully perform one of their main functions - affirming that bodies in anatomy laboratories are treated with due respect. This is of great importance as it was recorded that even some of the people who have already bequeathed their bodies to anatomy have concerns about their treatment in the laboratory (89).

Following Bolt's analysis, these findings can be related to the anthropological theory of gift giving (41, 49). Marcel Mauss' provided an anthropological analysis, where it is suggested that gift giving automatically creates social ties between the giver and the gift-receiver, as a result of the obligation to give something back in return (49). Applied to body donation this theory would

suggest that students perceive body donations as gifts, and that commemorations provide space for students to express gratitude towards body donors. It also suggests that potential and future body donors themselves and their families are able to observe firsthand the appreciation, benefits and educational rewards that come from donating ones' body to medical education. When applied to the findings in this study, a cycle of gift-giving is birthed (Figure 5.1).



**Figure 5.1: Cycle of gift giving in the context of body donation and commemorations and memorials in anatomy education**

However, encouraging body donation should not be seen as the motivation for the establishment of commemorations and memorials in a simplistic economy of sourcing laboratories. In order to maintain ethical weighting and meaningfulness, incorporation of both commemorations and memorials should be recognised by all stakeholders of anatomy and the wider community as being put in place for ethical reasons, specifically for the development of humanistic model of medical education and to honour those who have donated their bodies to medical education. Any changes in the frequency of body donations should be attributed to commemorations and memorials, but they should not be expected nor marketed towards gains of that sort.

## 5.6 Organisation of the Commemoration

The current literature describes differing modes of organisation and planning of commemorations in anatomy education worldwide. It is reported that it is either done in conjunction, or

independently between a variety of stakeholders in anatomy such as students (25, 29, 55), academic staff (25, 29), donor families and at times community representatives (12, 19, 25, 79). It was hypothesised in this study, that all students in favour of the commemoration would be inclined to organise it in conjunction with academic staff. Results revealed that academic staff alone, organising the commemoration was most preferable.

The findings also suggest that recent or current exposure to human remains, plays an imperative role in what perceptions are formed towards the format of commemorations in anatomy education.

It is, important to note that, preference to not take part in the organisation of the commemoration should be not perceived as a negative attitude *per se*, especially since the subset of responses that were in favour of establishing a commemoration were considered for this section.

Moreover, although limited, according to reports and communications on commemorations in anatomy education, medical students seem to be the main group of students more likely to want to be part of the organisation of these commemorations (19, 25, 42). Thus, since medical students were not surveyed for this project, it may explain the misalignment reflected between findings from this study and existing literature. What the findings further reveal, is that perhaps, the attitudes of non-medical students are shared globally. However, further investigation to whether there exists a vast difference in the attitudes of medical students relative to non-medical students would clarify these speculations.

Previous reports on commemorations in anatomy education link and discuss organisation and funding of the commemoration under the same heading implying that they are one in the same (25). Therefore, another reason as to why respondents from this study were more inclined for academic staff only to organise the event, was perhaps that they were under the impression that organisation meant also funding the commemoration financially.

It is clear that ongoing investigations into reasons why students partake in organising commemorations in anatomy education is important to clarify the speculations discussed above.

## **5.7 Attendance**

Another aspect of commemorations in anatomy education that was investigated was attitudes towards who should attend a potential commemoration. The hypothesis was that all students

would be inclined to attend, and that all students would also agree that it was important for anatomy staff and donor families to attend. This hypothesis was corroborated as the results revealed that the four major stakeholders that students expressed should attend the commemoration were: anatomy students, anatomy staff, donor families and future donors - with minor differences between.

Publications on existing commemorations report that they are attended by anatomy students, usually medical students, academic staff and the family members of body donors, where attendance is often reported in large numbers (12, 19, 25, 42, 50, 55). Data for this study was gathered from non-medical students, where respondents were from allied health degrees such as chiropractic, or pre-medical courses. Results for both organisation and attendance revealed that majority of anatomy students, regardless of degree are willing to organise the commemoration, and even a larger percentage are inclined to attend.

As mentioned before, one of the main changes in anatomy education is that it is now recognised as a discipline that is much more than identification of parts of the human body, rather it encompasses opportunities for students to develop professionally (1). As a consequence, the professional skills acquired, are applied beyond the environment they are learnt in (1). It is therefore vital for anatomy classrooms to be consistently inclusive to all groups of students so that skills regarding team work and interdisciplinary communication are acquired and maintained throughout students' anatomy education and eventually, career. In the case of anatomy modules being delivered at different times to different groups of students as a consequence of diverse course structures (similar to the MU setting), then perhaps, taking part in not only the attendance, but organisation of a commemoration in anatomy education is an optimal setting for interdisciplinary communication and professional skill development (115).

Sbayeh and colleagues revealed that students did not associate anatomy with professional development, teamwork and did not acknowledge any improved ethnical training related to anatomy or medicine (116). It is, however unknown whether the institutions that this investigation took place, have a commemoration or memorial incorporated in their programs. In a recent study, it was reported by students that the incorporation of a commemoration in the anatomy program strengthened and encouraged their sense of commitment and responsibilities towards their learning (62). It was also reported that students felt that the commemoration enhanced empathy towards body donors (62). These findings suggest that through these commemorations there is indeed room for professional and perhaps, even self-development.



Unmentioned in the literature is presence of future and potential body donors at these commemorations (12, 19, 25, 42, 43, 49, 55). With more than half of respondents indicating that future donors should attend the commemoration, perhaps this finding is necessary to investigate further.

In a way, the presence of future and potential donors at these commemorations continues the cycle of 'gift giving' and 'gift obligation' (117) – future donors observe expression of gratitude from students and therefore more inclined to donate and increased donation in turn increases frequencies of these commemorations (Figure 5.1). However, it is an ethical obligation that these commemorations are not put in place to solely influence an increase in body donations, instead they should be established to acknowledge past, present and future body donors for anatomical knowledge acquired from their gift.

It is vital to have ongoing investigations and even universal guidelines put in place regarding these issues, to maintain and establish meaningful commemorations in anatomy education on a global scale.

## **5.8 Social media**

For the last two decades, social media has been an important disseminator of information and ideas (38). Anatomy educators have utilised such platforms to share resources with students, such as short anatomy videos (26, 118), or to create a support network for students (119). In addition, social media platforms such as YouTube, have been utilised to share information on existing commemorations and memorials (38). According to what attitudes students would express in relation to recording a potential commemoration at MU for social media, it was hypothesised that students would express a positive attitude in support of the concept. However, findings from this study did not support this view. More than half of students expressed that the commemoration should not be recorded for social media, where a large number of responses were unknown.

There exist guidelines on the use of public domains such as social media in anatomy to prevent fuelling morbid curiosity, and to assist institutions to create a culture of respect for the privacy of the donors and their families (120, 121). These guidelines have been adopted at MU, in that anatomy educators at this institution enforce and encourage the development of appropriate conduct and respect that is expected of students handling human remains. One of the ways in which the notion mentioned is reinforced at MU, is the prohibition of any technological device with a camera in the anatomy laboratory as well as, making and sharing images outside of the

institutional education context. The culture fostered at MU may explain these findings, in that students perceive that the involvement of social media may diminish the level of respect towards and privacy of donors.

## **5.9 Reveal of Identity**

At institutions where commemorations exist in anatomy programs, the concept of revealing donor identities varies (12, 19, 122). Reasons for such variations are still being investigated. However, with exemplary shifts in anatomy paving the way as the norm, more institutions are inclined to partake in the reveal of donor identities as a way to reinforce the humanistic approach (62). The transition away from retaining donor anonymity has been welcomed by students and donor families (50, 55, 61), with reports of increased professional responsibility and less anxiety whilst dissecting resulting as a consequence (50, 55, 61). In regard to students' attitudes towards reveal donor identities, with consent from the donors and their next of kin, at a potential commemoration at MU, the hypothesis was that majority of students would be in agreeance. Results supported this hypothesis. Perhaps, the transparency demonstrated at MU regarding the humanistic shift in anatomy, has resonated with students and revealing identities of donors is perceived as a way to increase the conduct of respect and acknowledgement.

Concepts of humanising cadavers are well practiced in many institutions globally (12, 19, 20, 25, 45, 62, 79, 87, 122, 123). Since physician training commences in the anatomy laboratory (20), it is important for institutions to abide by this shift in order for students to develop compassion, professionalism and empathy whilst simultaneously gathering scientific competencies.

It is pivotal for institutions such as MU, where there is expression of interest from one the main stakeholders of anatomy – students, to implement notions such as commemorations and revealing identities of donors to foster a learning environment that encompasses all educational experiences that will flourish desired characteristics of healthcare professionals.

## 5.10 Recommendations

Based on the findings from this study, the recommendations related to commemorations and memorials going forward can be summarised in following points:

### Macquarie University (MU)

Based on students' attitudes MU should introduce anatomy commemoration following this format:

- 1) The commemoration should occur once a year, and students should be required to attend before entering the anatomy laboratory for the first time.
- 2) Organisation should be facilitated by academic staff and open to student participation from all anatomy students.
- 3) The commemoration should be open to anatomy staff, all past and present anatomy students, donor families and future/potential donors.
- 4) The commemoration should be secular in nature.
- 5) Indigenous representation should be considered when organising the commemoration.
- 6) With consent from donor families, or donor (when possible), donor identities should be revealed and celebrated during the commemoration.
- 7) The commemoration should not be recorded for social media.
- 8) The commemoration should include both artistic performances and symbolic objects.

However, the format of the commemoration at MU should be finalised following further consultation with other stakeholders of anatomy, particularly future donors and donor families. Future investigations should adopt the survey methodology utilised in this study which should be broadened by qualitative research. Based on the findings from this study, building of a permanent memorial on campus at MU should also be considered.

### General

- 1) The International Federation of Associations of Anatomists (IFAA) has placed guidelines to encourage institutions to hold 'Services of Thanksgiving' for those who have donated their bodies for medical education and research, where they recommend that the event should be attended by donor families, staff and students. Expressed support from students in this study highlight the need for more institutions to follow and adhere to these guidelines.

- 2) The format of the commemoration and memorials should be agreed on after extensive consultation with the main stakeholders of anatomy education and following the social and cultural norms of the community within which the institution in question operates. Experts from social sciences and humanistic disciplines should be involved in this process. In multicultural societies such as Australia, special attention should be paid to inclusiveness and formats of ceremonies that will not alienate minorities.
- 3) The relatively high number of “undecided” responses across all aspects of this study highlights the need for anatomy educators to incorporate some information about commemoration and memorials into the anatomy curricula. As well as this, clear communication about the ethical conduct of behaviour expected from students in anatomy and throughout their careers will set a standard to abide to and thus shape positive attitudes towards humanistic anatomy.

### **5.11 Limitations**

The limitations pertaining to this study were the following:

- 1) The cross-sectional design of the study was utilised due to the time limit of the length of this project. A longitudinal design would have provided further insight on students’ attitudes towards commemorations and memorials as it could have captured possible attitudinal changes as students’ progress through their anatomy education.
- 2) The limited nature of quantitative analysis is also a factor that should be considered. Quantitative analysis was used due to the time frame of this study. Mixed methods research that intertwine quantitative and qualitative analysis would enable investigators to flesh out findings to their full potential.
- 3) Attributing to the ten-month time frame, this project addressed only one stakeholder of anatomy, at one institution. Investigating all stakeholders of anatomy at multiple institutions would provide better understanding of the preferred format of commemorations and memorials. More broadly, research across different countries would enable investigators to explore general trends and patterns regarding commemorations and memorials. Such research would result in both understanding and organising commemorations and memorials in anatomy education that are representative of all stakeholders of anatomy, whilst encouraging relations between public and the discipline of anatomy.

## 6. CONCLUSION

Majority of anatomy students at Macquarie University expressed support for the establishment of a commemoration and construction of a memorial at the institution. These findings reflect the increasingly accepted humanistic approach to modern anatomy education. Students acknowledge the humanity of the cadaver and the need to express gratitude to those who bequeath their bodies for anatomy education.

Exposure to human remains, gender and attitudes to body donation are factors that influence what attitudes are shaped towards honouring body donors. Perceptions towards the phenomena of commemorations and memorials transcend religious and cultural boundaries.

Regarding findings from this study, it is vital to continue to educate and further students' ethical training in such a way that they become aware of the concepts and importance of commemorations and memorials. Education around this area of anatomy will not only engage students with one another, and donor families, but will pave the way for students to become life-long ethical practitioners and learners.

To further build on evidence towards this aspect of anatomy education, future investigations should consider attitudes of other stakeholders in anatomy such as donors, donor families and anatomy staff. A mix of quantitative and qualitative methodological approaches should be adopted during such inquiries.

It is only when such investigations are carried out that establishment of commemorations and constructions of memorials can be inclusive of all stakeholders of anatomy and carry significant ethical weighting. Therefore, communication and fostered trust between all stakeholders and the wider community will speak volumes as a result. This will ensure that the lack of gratitude and unethical practices that plagued anatomy will serve merely as an unrepeated history.

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## 8. APPENDIX




### Appendix 8.1

Students' Attitudes towards Memorial and Commemorations in Anatomy Education		MACQUARIE University	
PART ONE: GENERAL INFORMATION			
1.1 Age (Years): _____	1.7 Please tick the anatomy unit(s) that you are currently enrolled in:	1.10.a What are some of the main reasons for your answer in question 1.10? (You may tick more than one answer)	2.2 Who should organise the commemoration ceremony? (You may tick more than one answer)
1.2 Gender:	<input type="checkbox"/> HLTH108: Introduction to Anatomy	<input type="checkbox"/> Religious reasons	<input type="checkbox"/> Anatomy students
<input type="checkbox"/> Male	<input type="checkbox"/> HLTH109: Anatomy of the Limbs and Back	<input type="checkbox"/> I want to make a difference after my death	<input type="checkbox"/> Anatomy staff
<input type="checkbox"/> Female	<input type="checkbox"/> HLTH213: Anatomy of the Head, Neck and Trunk	<input type="checkbox"/> I want to further education and research in medicine	<input type="checkbox"/> University staff (other than anatomy)
<input type="checkbox"/> Other	<input type="checkbox"/> HLTH214: Neuroanatomy	<input type="checkbox"/> I am unsure about what is involved in the process	<input type="checkbox"/> Other, please specify: _____
<input type="checkbox"/> Prefer not to say	<input type="checkbox"/> None	<input type="checkbox"/> I am concerned that my body will not be treated with respect	2.3 Who should attend the commemoration ceremony? (You may tick more than one answer)
1.3 What is your country of birth? _____	1.8 Please tick the anatomy units you have completed:	<input type="checkbox"/> Other, please specify: _____	<input type="checkbox"/> Anatomy students
1.4 Please specify your ethnic background: (e.g. Australian, English, Irish, Italian, Chinese) *	<input type="checkbox"/> HLTH108: Introduction to Anatomy	<input type="checkbox"/> Anatomy staff	
_____	<input type="checkbox"/> HLTH109: Anatomy of the Limbs and Back	<input type="checkbox"/> University management	
1.5 Which religion do you identify yourself with? (e.g. No religion, Catholic, Anglican, Buddhism, Islam, Baptist) *	<input type="checkbox"/> HLTH213: Anatomy of the Head, Neck and Trunk	<input type="checkbox"/> Local Government bodies	
_____	<input type="checkbox"/> HLTH214: Neuroanatomy	<input type="checkbox"/> Donor families	
1.6 Degree you are currently enrolled into (e.g. Bachelor of Science, Bachelor of Medical Science, Bachelor of Chiropractic, Masters of Chiropractic, Non-award):	<input type="checkbox"/> Other (Please Specify): _____	<input type="checkbox"/> Future/potential body donors	
<input type="checkbox"/> Bachelor of Chiropractic Sciences	<input type="checkbox"/> None	<input type="checkbox"/> Media	
<input type="checkbox"/> Bachelor of Medical Sciences	1.9 Currently, I am:	<input type="checkbox"/> Other, please specify: _____	
<input type="checkbox"/> Bachelor of Sciences (Major: _____)	<input type="checkbox"/> a domestic student	2.4 Should the commemoration ceremony include any religious involvement?	
<input type="checkbox"/> Bachelor of Human Sciences	<input type="checkbox"/> an international student	<input type="checkbox"/> Yes	
<input type="checkbox"/> Other (Please Specify): _____	1.10 Would you consider donating your body to a medical school for anatomical study and education after your death?	<input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Undecided	<input type="checkbox"/> Undecided	
		2.1.a. Please provide reasons for your answer.	
		<div></div>	

1

\*All examples adapted from Australian Bureau of Statistics



2

<div><div></div><p>2.5 Should the commemoration include an Aboriginal and Torres Strait Islander representative?</p><p><input type="checkbox"/> Yes</p><p><input type="checkbox"/> No</p><p><input type="checkbox"/> Undecided</p><p>2.6 Should the identity of the donors be revealed at the commemoration (with consent from families)?</p><p><input type="checkbox"/> Yes</p><p><input type="checkbox"/> No</p><p><input type="checkbox"/> Undecided</p><p>2.7 Should the commemoration include any artistic performances, e.g., music/artworks/ reflective poems?</p><p><input type="checkbox"/> Yes</p><p><input type="checkbox"/> No</p><p><input type="checkbox"/> Undecided</p><p>2.7.a. If you answered 'Yes' to 7. Please specify the types of artistic performances that should be included (you may tick more than one answer).</p><p><input type="checkbox"/> Music</p><p><input type="checkbox"/> Artworks</p><p><input type="checkbox"/> Reflective poems</p><p><input type="checkbox"/> Dance performances</p><p><input type="checkbox"/> Other, please specify: _____</p></div>	<div><div></div><p>2.8 Should the commemoration include any symbolic objects, e.g., flowers/candles?</p><p><input type="checkbox"/> Yes</p><p><input type="checkbox"/> No</p><p><input type="checkbox"/> Undecided</p><p>2.8.a If you answered 'Yes' to 8. Please specify the types of symbolic objects that should be included (you may tick more than one answer).</p><p><input type="checkbox"/> Flowers</p><p><input type="checkbox"/> Candles</p><p><input type="checkbox"/> Other, please specify: _____</p><p>2.9 Should the commemoration be recorded for social media?</p><p><input type="checkbox"/> Yes</p><p><input type="checkbox"/> No</p><p><input type="checkbox"/> Undecided</p><p>2.10 How often should the commemoration be carried out?</p><p><input type="checkbox"/> Once a year</p><p><input type="checkbox"/> Twice a year</p><p><input type="checkbox"/> Other, please specify: _____</p><p><input type="checkbox"/> Undecided</p></div>	<div><div></div><p>2.11 If students were required to attend the commemoration, when should they first attend?</p><p><input type="checkbox"/> Before students enter anatomy lab for the first time</p><p><input type="checkbox"/> After students complete all units that require the anatomy lab</p><p><input type="checkbox"/> Other, please specify: _____</p><p>2.12 Should there be a place/symbolic object at the university permanently dedicated to past, present and future body donors (e.g., a bench/tree/sculpture)?</p><p><input type="checkbox"/> Yes (go to 2.13)</p><p><input type="checkbox"/> No (go to 2.12a)</p><p><input type="checkbox"/> Undecided (go to 2.13)</p><p>2.12.a. Please provide reasons for your answer.</p><div></div></div> <div><p>2.13 Please feel free to make any comments or suggestions on anatomy memorial and commemoration in the space provided below.</p><div></div><p><u>Thank you for participating in this study.</u></p></div>
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## Appendix 8.2

Appendix 8.2 (page 60) removed from Open Access version as it may contain sensitive/confidential content.

## Appendix 8.3

 <p>Dear A/Prof Strkalj</p> <p>RE: Ethics project entitled: "Students' Attitudes towards Commemorations and Memorials in Anatomy Education"</p> <p>Ref number: 5201800248</p> <p>The Faculty of Science and Engineering Human Research Ethics Sub-Committee has reviewed your application and granted final approval, effective 17/05/2018. You may now commence your research. This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:</p> <p><a href="http://www.nhmrc.gov.au/files/nhmrc/publications/attachments/e72.pdf">http://www.nhmrc.gov.au/files/nhmrc/publications/attachments/e72.pdf</a>.</p> <p>The following personnel are authorised to conduct this research:</p> <p>A/Prof Goran Strkalj Ms Joyce El-Haddad A/Prof Richard Appleyard Dr Dane Turner Dr Kehui Luo</p> <p>NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.</p> <p>Please note the following standard requirements of approval:</p> <ol style="list-style-type: none"> <li>1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).</li> <li>2. Approval will be for a period of five (5) years subject to the provision of annual reports.</li> </ol> <p>Progress Report 1 Due: 17/05/2019 Progress Report 2 Due: 17/05/2020 Progress Report 3 Due: 17/05/2021 Progress Report 4 Due: 17/05/2022 Final Report Due: 17/05/2023</p> <p>NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.</p> <p>Progress reports and Final Reports are available at the following website:</p>	 <p><a href="http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms">http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms</a></p> <ol style="list-style-type: none"> <li>3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).</li> <li>4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:</li> </ol> <p><a href="http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms">http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms</a></p> <ol style="list-style-type: none"> <li>5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.</li> <li>6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:</li> </ol> <p><a href="http://www.mq.edu.au/policy/">http://www.mq.edu.au/policy/</a></p> <p><a href="http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy">http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy</a></p> <p>If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.</p> <p>If you need to provide a hard copy letter of Final Approval to an external organisation as evidence that you have Final Approval, please do not hesitate to contact the Ethics Secretariat at the address below.</p> <p>Please retain a copy of this email as this is your official notification of final ethics approval.</p> <p>Yours sincerely, Human Research Ethics Sub-Committee Faculty of Science and Engineering Macquarie University NSW 2109</p>
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## Appendix 8.4

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## Appendix 8.5

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Clustered Bar Chart of Commemoration Attitudes and Ethnicity

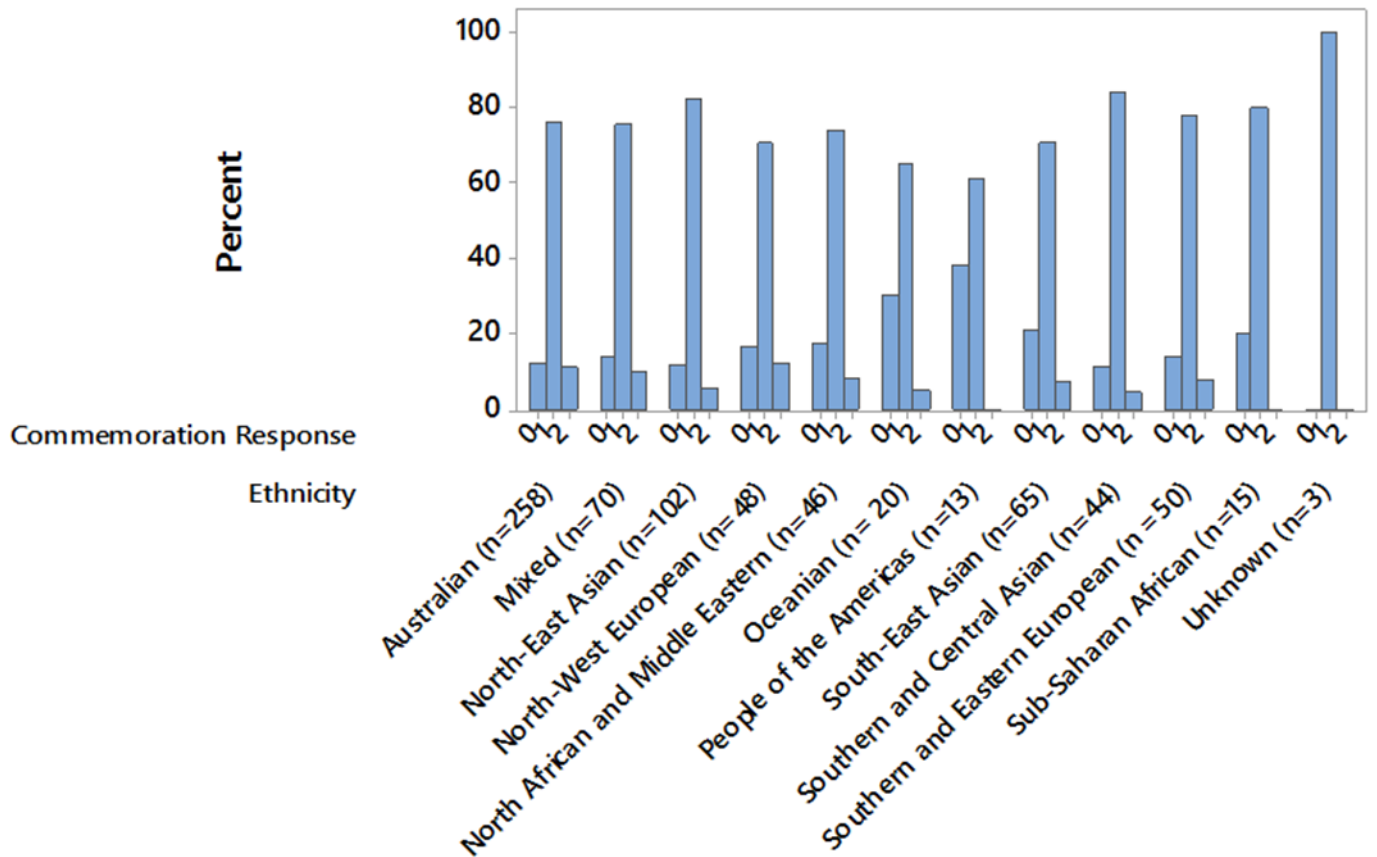


Figure 8.1: The influence of ethnicity on attitudes towards commemorations. For Commemoration Response: 0 = Unknown, 1= Yes, 2= No.

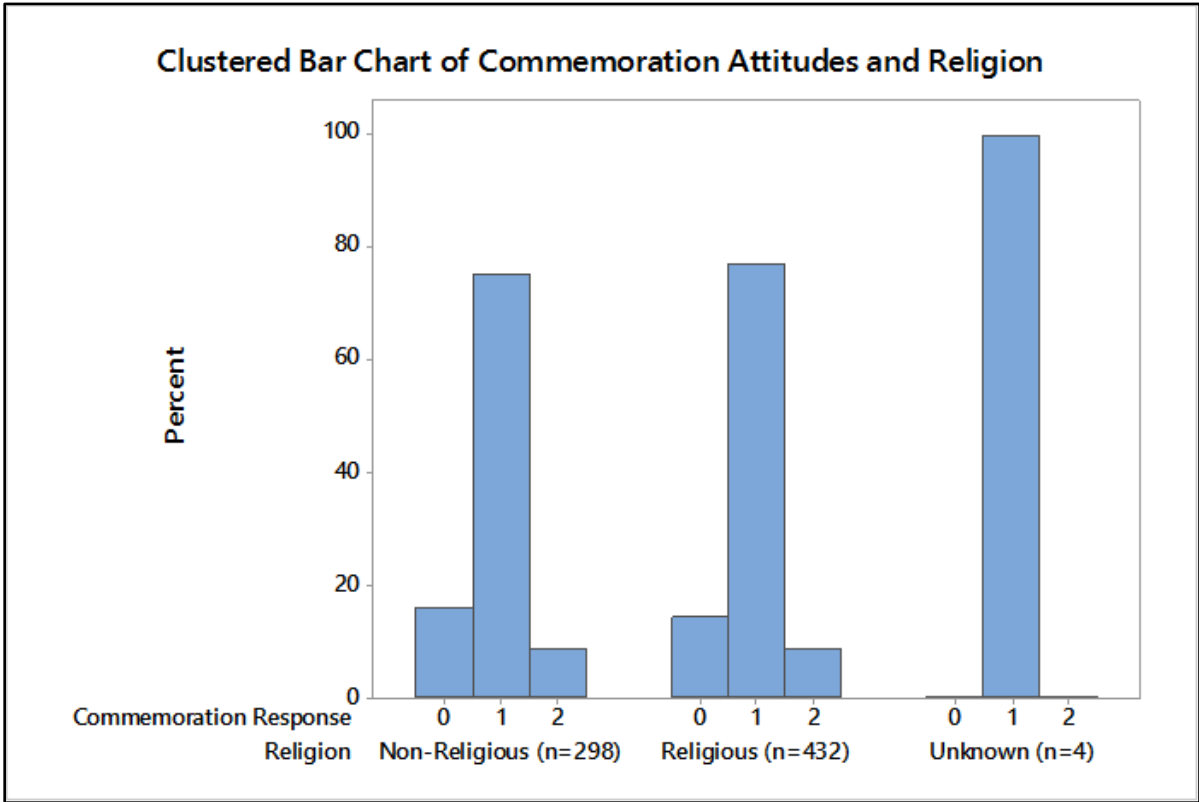


Figure 8.2: The influence of religion on attitudes towards commemorations. For Commemoration Response: 0= Unknown, 1= Yes, 2= No.

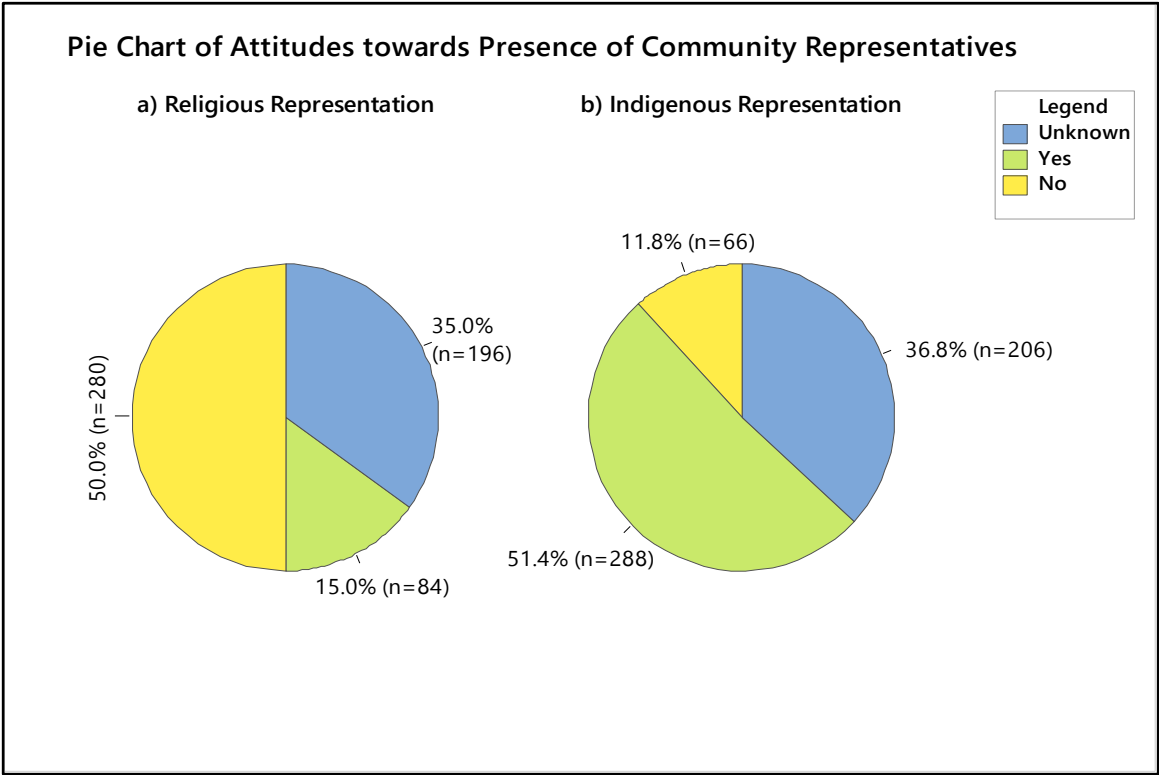


Figure 8.3: Attitudes towards presence of community representatives

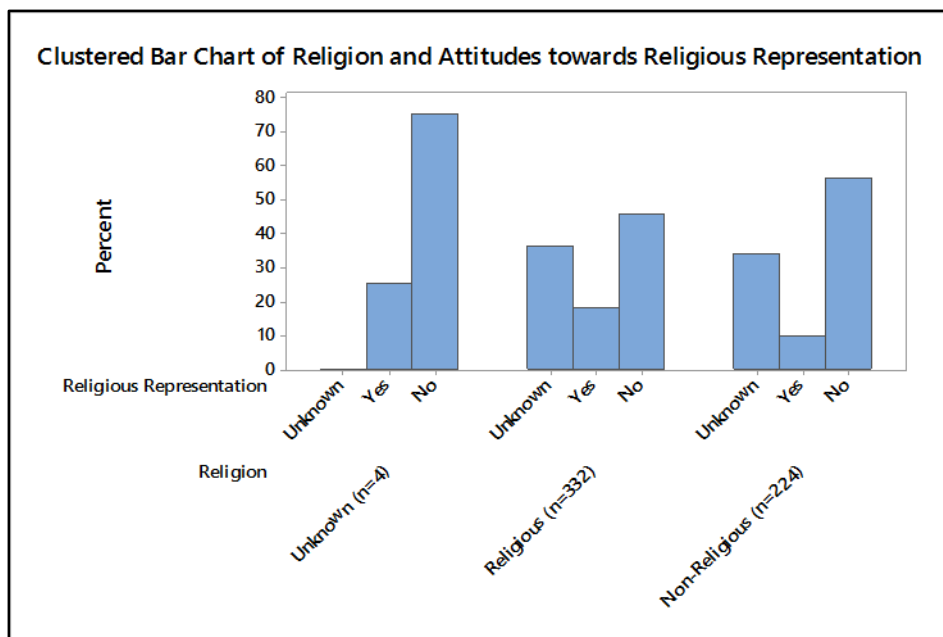


Figure 8.4: Influence of religion on attitudes towards the presence of religious representation

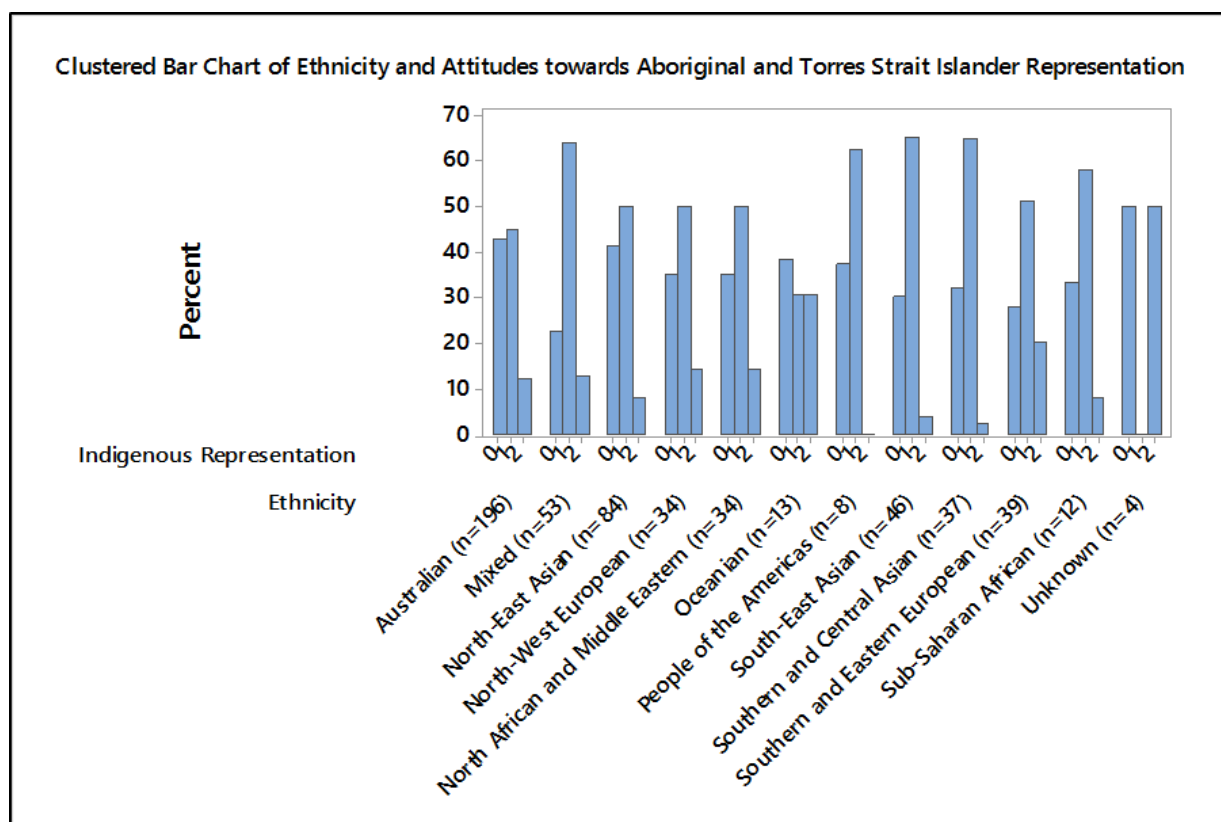
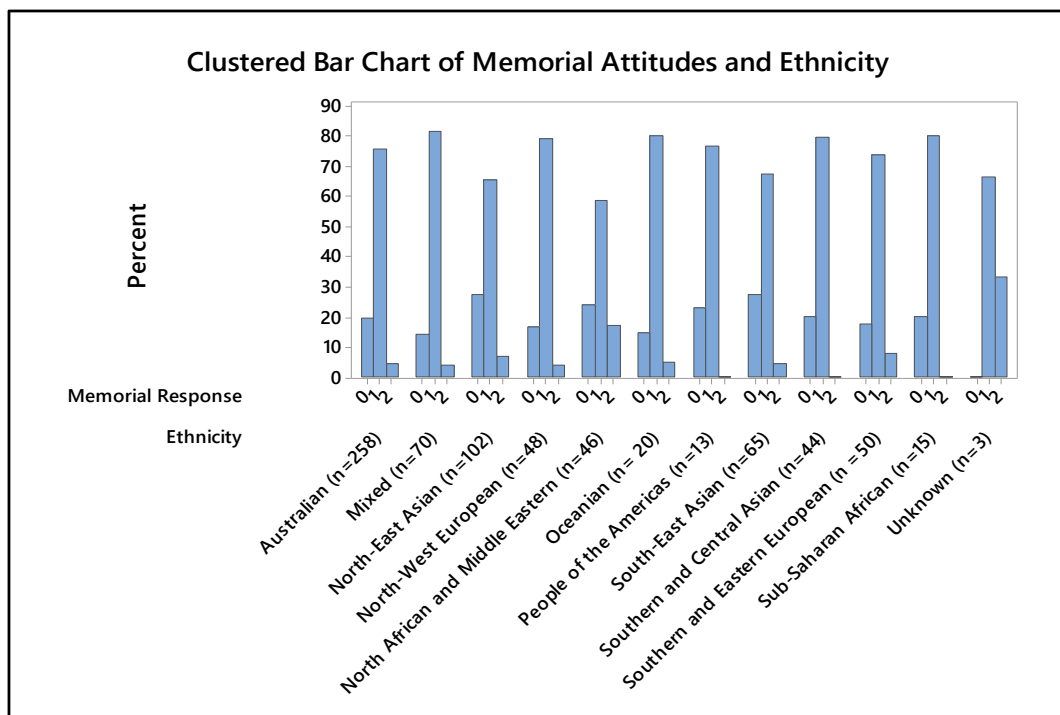
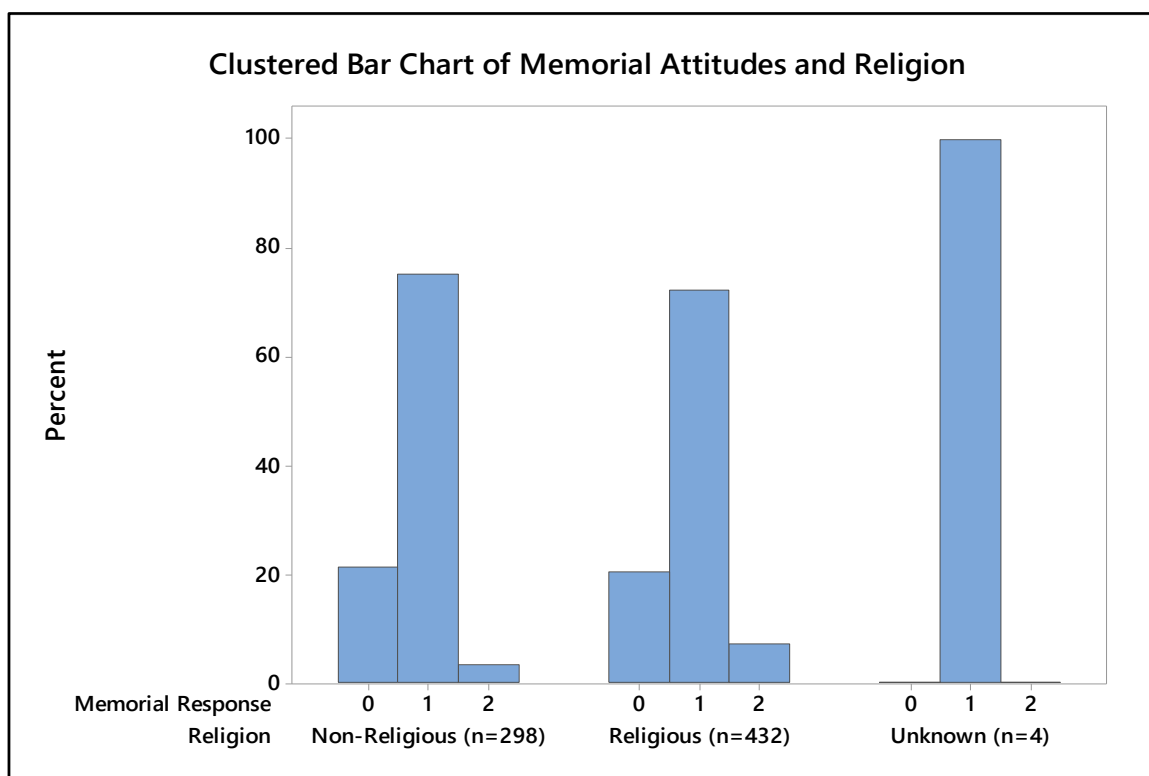


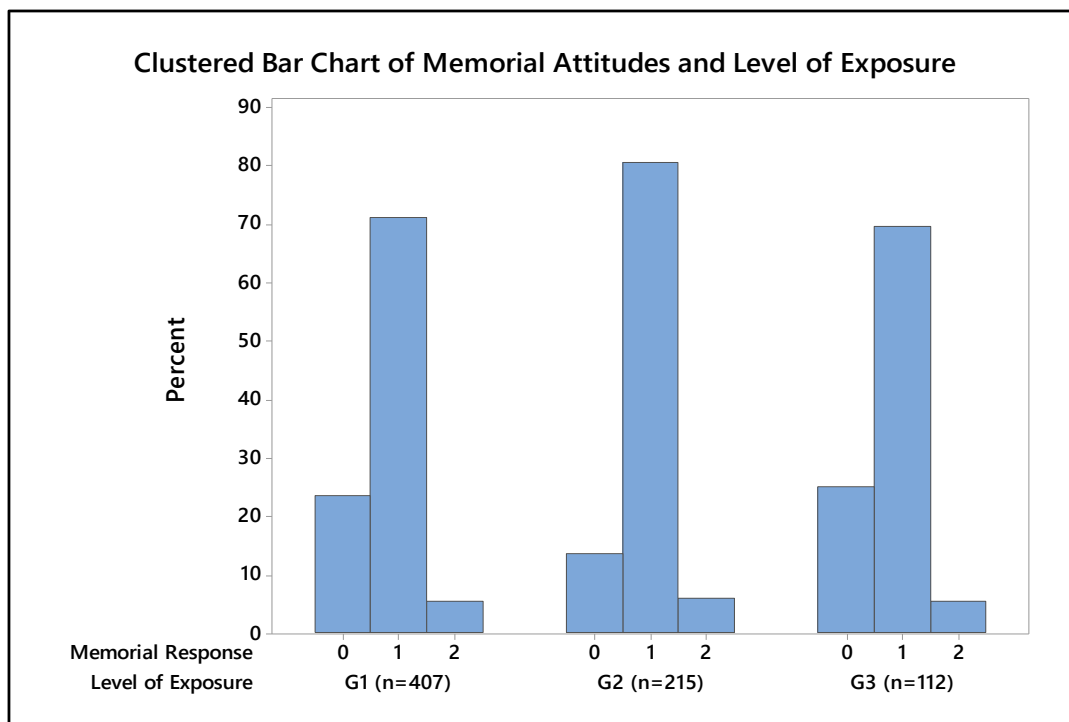
Figure 8.5: Influence of ethnicity and attitudes towards Aboriginal and Torres Strait Islander representation. For Indigenous Representation: 0= Unknown, 1= Yes, 2= No.



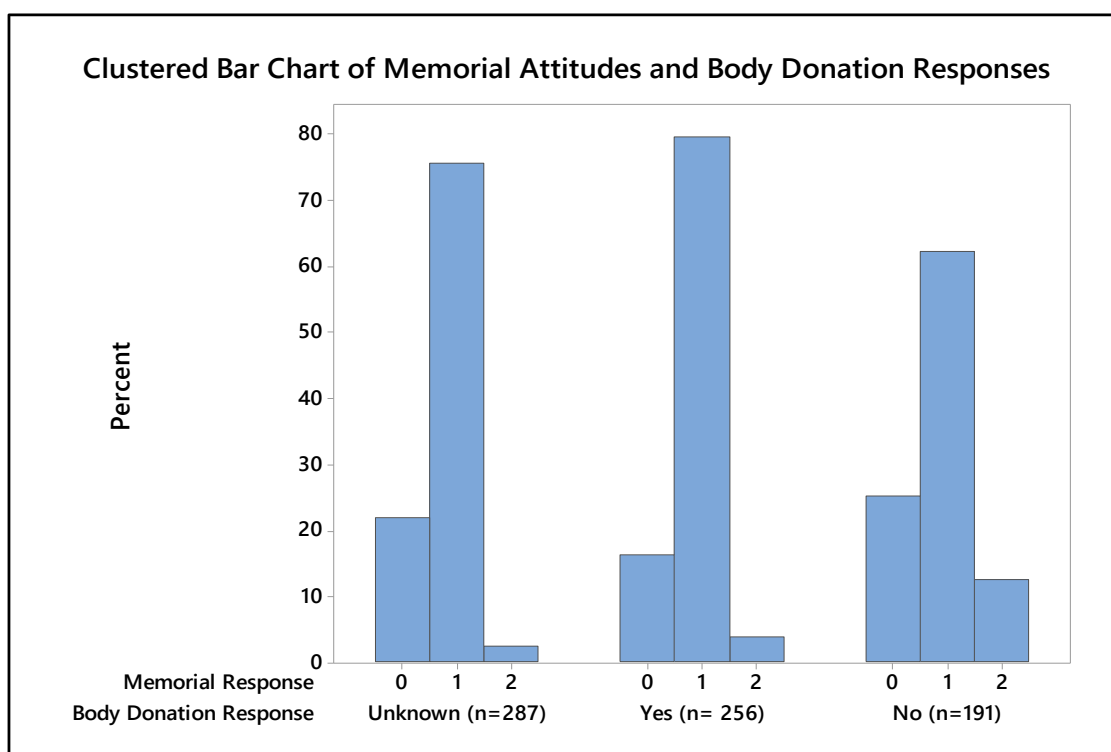
**Figure 8.6: The influence of ethnicity on attitudes towards memorials. For Memorial Response: 0= Unknown, 1= Yes, 2= No.**



**Figure 8.7: The influence of religion on attitudes towards memorials. For Memorial Response: 0= Unknown, 1= Yes, 2= No.**



**Figure 8.8: The influence of level of exposure on attitudes towards memorials. Support for memorial: 0= Unknown, 1= Yes, 2= No. For Level of Exposure: G1 = Anatomy students who were not exposed to human remains during their practical, G2 = Anatomy students who were currently undertaking a unit that had a cadaver laboratory component, G3= Past anatomy students who have completed all anatomy subjects that require the cadaver laboratory.**



**Figure 8.9: The influence of body donation response on attitudes towards memorials. Support for memorial: 0= Unknown, 1= Yes, 2= No.**