



Research article

Anatomists' views on human body dissection and donation: An international survey



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ABSTRACT

A survey was conducted to test three hypotheses: anatomists believe that dissection by students conveys not just anatomical knowledge but also essential skills and attitudes, including professionalism; anatomists approve of the donation of their own bodies or body parts/organs for medical/health-care training and research; attitudes towards body dissection and donation are not dependent upon gender or upon the extent of teaching experience, but are related to transcendental convictions relating to beliefs in the afterlife. Eighty-one anatomists, from 29 countries responded to the survey; 80% indicated that they required medical/health-care students to dissect human cadavers (60% females–86% males, $p=0.02$). Most teachers recorded that dissection was an instrument for training undergraduate students, an instrument for the development of professional skills, and an instrument to help to control emotions in the future doctor rather than being only a means of teaching/learning anatomy facts. Males were more receptive to the concept that dissection helps to control emotions in the future doctor ($p=0.02$). Most teachers (75%) said they were willing to donate their bodies, 41% saying they would donate body organs only, 9% would donate their entire bodies only, 25% would separately donate organs and also the entire body. The willingness to donate increased significantly with the years of teaching experience ($p=0.04$). Teachers who were not believers in the afterlife were more likely to donate their organs/bodies than were believers ($p=0.03$). Our findings showed that anatomists' attitudes towards body dissection and donation are dependent upon gender, upon the extent of teaching experience, and upon transcendental convictions.

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1. Introduction

This paper aims to present information gathered by means of responses from questionnaires from an international sample of professional anatomists; on issues relating to (a) the percentage of undergraduate students practising dissection on cadavers, (b) the expected benefits of practising dissection, (c) issues related to the undergraduate students' emotional responses to cadavers, and (d) the attitudes of anatomists towards donation of their own body for anatomical examination. A further goal (e) was to ascertain to what extent anatomists' attitudes on these issues were reliant upon

gender, the degree of teaching experience, and/or upon transcendental convictions relating to beliefs in the afterlife.

Despite the decline in teaching hours devoted to anatomy in current medical curricula (e.g. Drake et al., 2009; Pawlina, 2009), gross anatomy remains one of the most important basic sciences in daily medical practice (Orbson et al., 2013). Compared to other basic sciences in medicine (i.e. biochemistry, bioethics, histology, cytology, microbiology, pharmacology, physiology, psychology), there is evidence to suggest that gross anatomy is considered by medical graduates to be the most relevant basic science discipline for surgical specialties, whereas pharmacology, physiology and then gross anatomy are the disciplines most relevant for medical specialties (Arráez-Aybar et al., 2010b). For gross anatomy courses, undergraduate students not only acquire basic theoretical knowledge about the human body, but also gain skills and attitudes needed for clinical practice (Vázquez et al., 2005; Patel and Moxham, 2006; Rizzolo and Stewart, 2006; Moxham and Plaisant, 2007; Raftery, 2007; Sugand et al., 2010) as well as develop attributes classified as “professionalism” (Lachman and Pawlina, 2006; Pawlina, 2006;

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Arráez-Aybar et al., 2008; Netterstrøm and Kayser, 2008; Wittich et al., 2013).

Dissection of cadavers is historically linked to the teaching and learning of anatomy but is also considered by many to be the most beneficial teaching methodology (e.g. Patel and Moxham, 2006; Rath and Garg, 2006; Ajita and Singh, 2007; Sañudo et al., 2007; Korf et al., 2008; Anyanwu and Ugochukwu, 2010; Sugand et al., 2010). Furthermore, dissection is the teaching method favoured both by undergraduate students (McGarvey et al., 2001; Moxham and Moxham, 2007) and by many professional educators (Patel and Moxham, 2008). However, from the Renaissance to the present day, cadaveric dissection has transformed from being a major source for anatomical research to a tool for learning and training in anatomy, medicine and surgery (from 16th century to the first half of the 20th century), to nowadays being considered as “old fashioned”. The latter view is particularly expressed by teachers of basic sciences other than in gross anatomy. Indeed, in the later part of the 20th century, dissection has been excluded from some medical/health-care curricula in the belief that new technologies should replace it (Dyer and Thorndike, 2000). The argument is raised that the emotional distress caused by actual contact with death can be thus avoided (McLachlan et al., 2004; Miguel-Pérez et al., 2007; Bati et al., 2013). It can be argued, however, that such emotions add value to human dissection, providing a catalyst for moral transformation (Warner and Rizzolo, 2006) and thus promoting the development of professional competence in the future doctor (Arráez-Aybar et al., 2008; Patel and Moxham, 2008; Kelly and Nisker, 2010).

Other problems related to dissection could be associated with the management and financing of cadaveric material by institutions, leading to the debate about “teaching anatomy with or without cadavers” (McLachlan et al., 2004; Biasutto et al., 2006; Winkelmann, 2007). The way in which human bodies were obtained and handled in the past has led to major reforms in anatomical science education (Vázquez et al., 2005), alongside major ethical and legal considerations (McHanwell et al., 2008; Jones and Whitaker, 2012; Riederer et al., 2012). Furthermore, there are major differences between the teaching methods, technologies and practices used by “developed and developing” countries (Anyahie et al., 2011). These differences are unfortunately becoming increasingly wide in medical/health-care professional training. This is also true with regard to the ways by which cadavers are acquired for dissection. Putting aside clearly reprehensible historical procedures (Bailey, 2002; Sappol, 2002; Hildebrandt, 2008), nowadays cadavers are acquired through altruistic body-bequest programmes in many countries (Stott, 2008; McHanwell et al., 2008; Park et al., 2011; Anyanwu and Obikili, 2012; Cornwall et al., 2012; Riederer et al., 2012), but in other countries almost all the bodies that are acquired are unclaimed bodies or are bodies of criminals condemned to death (Kinfu, 2008; Gangata et al., 2010; Akinola, 2011; Anyanwu et al., 2011).

Ethical and efficient body donation programmes are essential to permit continuation of dissection in current medical/health-care professional curricula. Consequently, there have been several studies assessing the subjective drives motivating the general public (Boulware et al., 2004; Bolt et al., 2010, 2011; Anteby et al., 2012; Cornwall et al., 2012; Halou et al., 2013), undergraduate medical students (Burra et al., 2005; Essman and Thornton, 2006; Edwards et al., 2007; Cahill and Ettarh, 2008; Perry and Ettarh, 2009; Cahill and Ettarh, 2011) and medical professionals (Ballala et al., 2011) to donate their bodies to anatomical research and teaching. Recently, Rokade and Gaikawad (2012) have compared these three groups and stated that the influences upon opinions towards body donation are multifactorial. Evidence is available suggesting that the influences include age, personality, level of education, body image, views on death and mortality, religion, culture, previous experiences with donation of others, and humanitarian

concerns (Boulware et al., 2002; Conesa et al., 2004; Ajita and Singh, 2007; Ríos et al., 2010; Cornwall et al., 2012; Jernigan et al., 2013). Wijbenga et al. (2010) have reported that even last-minute impulses have a bearing upon body donation. Despite these reports, studies on why anatomists wish to donate their body to anatomical research and teaching are scarce. Although such studies have been performed in Spain (Arráez-Aybar et al., 2004), Turkey (Sehirli et al., 2004), Lebanon (Alashek et al., 2009), Niger (Anyanwu and Obikili, 2012) and the Netherlands (Bolt et al., 2012), there is no reliability, either in the issues investigated or in the methodologies employed. In view of the dearth of information, we are surveying anatomists' attitudes to body donation and have formulated three hypotheses:

(1) Anatomists believe that gross anatomy and dissection by students conveys not just anatomical knowledge but also essential skills and attitudes including professionalism; (2) anatomists approve of the donation of their own bodies or body parts/organs for medical/health-care training and research; (3) attitudes towards body dissection and donation are not dependent upon gender, or upon the extent of teaching experience but are related to transcendental convictions relating to beliefs in the afterlife.

2. Materials and methods

2.1. Population surveyed

The present study was carried out during the “Joint Meeting of Anatomical Societies” (hereafter termed Joint Meeting) held between the 19th and 22nd of May 2011 at the Uludag University Convention Centre, Bursa (Turkey). The study involved completing a questionnaire (Box 1). Previously, during the 9th Congress of the European Association of Clinical Anatomy (EACA) held between the 5th and 8th of September 2007 at Prague's Charles University Third Faculty of Medicine, a preliminary study was performed to test and validate the questionnaire.

Participation in the present study was voluntary and anonymity and confidentiality were guaranteed. Demographic data concerning the respondents (country of origin, gender and years of professional activity as teachers of anatomy) were requested. Two hundred questionnaires were distributed amongst attendees to the Joint Meeting. Most attendees belonged to six anatomical societies: the “Anatomical Society” (AS) mainly representing anatomists from Great Britain and Ireland, the “Anatomische Gesellschaft” (AG), the “Schweizerische Gesellschaft für Anatomie, Histologie und Embryologie (Swiss Society for Anatomy, Histology, and Embryology)” (SGAHE-SSAHE), the “Sociedad Anatómica Española” (SAE), the “Società Italiana di Anatomia e Istologia” (SIAI), and the “Türk AnATOMI ve Klinik AnATOMI Derneği” (TAKAD). TAKAD was responsible for organising the Joint Meeting.

2.2. Methodology

Questionnaires were distributed, and collected, by hand. The items within the questionnaire sought to obtain data on the practice, and consequences, of dissection undertaken by undergraduate students and also the opinions of anatomists about donating their own bodies and body organs. Two different parameters were considered for analysis of each item: teacher's gender and teacher's teaching seniority. The teacher's beliefs in life after death (transcendental/spiritual convictions) were also taken into account as well as possible geopolitical/cultural differences. The rationale of the survey was as follows:

- i. A dichotomous question was asked in order to find out whether the undergraduate students of the survey's respondents performed human dissection.

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