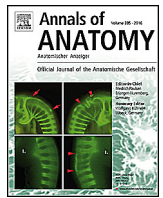




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An assessment of the anatomical knowledge of laypersons and their attitudes towards the clinical importance of gross anatomy in medicine

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ABSTRACT

If it is accepted that increasingly we live within a consumerist society then axiomatically 'ownership' of medical training does not belong to political authorities (whether governmental or medical), nor to the medical profession, nor indeed to the teachers, educationalists and even the students but to the laypersons in society who are patients or potential patients (viz. the clients/recipients of medical care). As yet, however, there has been no attempt to evaluate how much anatomy laypersons know and what their attitudes are towards the importance of anatomy in medicine. By means of a questionnaire, we have conducted a survey of laypersons' attitudes to anatomy in the U.K. and France. Results suggest that, regardless of gender, age, socioeconomic groupings, level of education, or in the presence of some cultural differences between the U.K. and France, laypersons have a reasonable understanding and knowledge of gross anatomy (being weakest on understanding function) and have strong beliefs that gross anatomy is crucial for medical education, holding the view that the medical profession's esteem would be diminished if anatomy were not a significant part of the medical curriculum and if human cadaveric material was not employed in medical training. Thus, laypersons' perceptions about the importance of gross anatomy should be factored into the organisation of medical training, not just to provide important information and skills for future medical/surgical practitioners, but also to help maintain the esteem of the medical profession.

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1. Introduction

There have been many reports showing that the amount and type of teaching of gross anatomy in the medical curriculum has changed radically during recent times (e.g. Monkhouse, 1992; Utting and Willan, 1995; Dangerfield et al., 2000; Plaisant et al., 2004; Pryde and Black, 2005; Drake et al., 2002, 2009, 2014). In particular, Drake et al. (2002, 2009, 2014) found that, within US medical schools, the average number of contact hours devoted to gross anatomy decreased from about 170 h to 147 h between 2002 and 2014 and that many courses were now part of an integrated curriculum. For the U.K., in 1993, 2003, and 2009, the General

Medical Council radically altered its guidelines for the training of medical practitioners in the United Kingdom in documents called "Tomorrow's Doctors". A key issue addressed related to the belief that medical students were being overloaded with facts and were, therefore, not being adequately equipped to interact effectively with patients. This led to significant decreases in the amount of anatomy and physiology being taught in medical school. Regarding changes to the methods of teaching of gross anatomy, to accommodate significant cuts to the time spent teaching anatomy, and to change from dissection of cadavers, medical schools have employed other methods such as didactic teaching, problem-based learning (PBL), use of prosections, teaching with models and plastinated specimens, computer-based programmes, and living and radiological/medical imaging techniques (Reidenberg and Laitman, 2002; Pabst, 2002; Prince et al., 2003; Plaisant et al., 2004; McLachlan, 2004; Hinduja et al., 2005; McLachlan and Patten, 2006; Patel and Moxham, 2006; Moxham and Moxham, 2007; Winkelmann, 2007; Korf et al., 2008; Kerby et al., 2011; Moxham and Plaisant,

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2014; Riederer et al., 2015). In particular, it is perceived that the decrease in teaching hours in anatomy has gone alongside a shift from a teacher-centred approach towards a more student-centred approach. An important trend has been the promotion of professionalism within the medical students during anatomy courses (e.g. Camp et al., 2010; Pearson and Hoagland, 2010; Wittich et al., 2013; Pawlina and Drake, 2015; Harden, 2015) and this has major impact upon how health care works interact with laypersons (patients and potential patients).

In view of the changes in anatomical education, it is important that the clinical relevance of anatomy is assessed objectively, including investigation of attitudes amongst the stakeholders and recipients of medical education. For example, using similar Thurstone and Chave (1951) analyses as employed in the present study, it has been reported that very positive attitudes towards the clinical importance of anatomy has been discerned for professional anatomists, medical students, and dental students (Patel and Moxham, 2006; Moxham and Plaisant, 2007; Moxham and Moxham, 2007; Kerby et al., 2011; Olowo-Ofayoku and Moxham, 2014; see also Pabst, 1993, 2009). It seems to us appropriate now to discover the level of knowledge of gross anatomy held by laypersons (i.e. patients and potential patients) and to assess their attitudes towards the importance of this subject in medical clinical education and practice. To date, these issues have not been investigated and consequently we present here the results of a survey in the United Kingdom and France that used a questionnaire to evaluate how much anatomy is known by the layperson and to find out how relevant anatomy is thought to be to medicine in society today.

Our initial hypotheses are that laypersons have a reasonable general understanding of the anatomy of the human body and believe that a good knowledge of anatomy by medical practitioners is essential. We also hypothesise that, without a good knowledge of human anatomy and without training using dissection of human cadavers, the public would consider that the esteem of the medical profession would diminish.

2. Methods

Five hundred and five questionnaires were distributed to members of the general public for this survey, with two hundred and eighty three responses (101 from the U.K. and 182 from France) giving a response rate of 56%. In order to get respondents that were unknown to the investigators, we adopted the following methodology. Medical students in both the U.K. and France were provided with questionnaires, 10 for each student enrolled. Each student was clearly instructed in how to further distribute these questionnaires to members of the general public where they lived. It was particularly emphasised that the questionnaires must not be given to friends and relatives and also not to persons who had connections with the health care professions. Within the questionnaire there was a question relating to how the respondents might have knowledge of anatomy and only 4 respondents had some involvement in health care professions and these were not used in the survey.

The questionnaire consisted of 4 sections. Section A contained a set of introductory questions to obtain personal information (age, gender, occupation etc.). Section B comprised a set of Thurstone and Chave (1951) attitude analysis questions (Fig. 1) where the respondents had to indicate which statements relating to the possible importance of gross anatomy they were in full agreement. Section C consisted of outlines of the human body where anatomical structures had to be identified (Figs. 2 and 3) and a brief set of questions asking for the functions of some human organs (Fig. 4). Altogether, 19 questions were asked in this section of the questionnaire. Section D asked questions about the importance of anatomy in medical education and within the medical profession.

statements	Medians
Although anatomy is interesting, the subject needs selective understanding in the clinic.	7
Anatomical terminology is the vocabulary of medicine.	2
Anatomy is a useful tool for satisfactory medical practice.	3
Anatomy is a "necessary evil" in Medicine.	7
Anatomy is of some use in the clinic, but its importance may be exaggerated.	8
Anatomy is only of benefit in certain medical specialities.	7
Anatomy is so old fashioned that it has no importance in contemporary Medicine.	11
Anatomy is time wasted in the medical curriculum.	11
Anatomy needs to modernise if it is going to be really useful in Medicine.	6
Every doctor must have a good knowledge of Anatomy.	2
If alternative and Eastern Medicine can do without Anatomy, so can Western Medicine.	10
It is impossible to conceive of good medical training without a major Anatomy component.	2
It is not possible to make a reasonable medical diagnosis without Anatomy.	2
Medicine could not exist without Anatomy.	1
Most medical conditions do not require a great knowledge of Anatomy.	8
Of all the basic sciences, Anatomy is the most relevant	3
Only a limited anatomical knowledge is required for satisfactory medical practice.	7
Rather than learn Anatomy, medical students should concentrate on clinical sciences.	9
The principles of Medicine are not founded on anatomical knowledge.	9
Without a knowledge of Anatomy the doctor is of limited effectiveness.	3

Fig. 1. Statements in the questionnaire used to assess the attitudes of laypersons towards the importance of anatomy in medicine according to the method devised by Thurstone and Chave (1951). In answering the questionnaire, a respondent is required only to indicate with which statements he/she is in complete agreement. Note that the medians provided here for each statement, and obtained independently by a panel of 'judges', were not seen by the responding laypersons.

Thurstone and Chave (1951) analyses involve listing 20 statements that reflect either a positive, negative or indifferent/moderate attitude; the statements being ordered randomly. Each statement in the list was assigned a numerical value by a panel of 50 "judges" not participating in the survey. Each "judge" assigned a value from 1 to 11 to each statement, a score of 11 suggesting that anatomy is unnecessary in clinical medical education and a score of 1 indicating that anatomy is crucially important. Values between 1 and 11 were assigned to indicate different shades of opinion along the possible spectrum of attitudes. From the data obtained from the panel of "judges", a median was taken for each statement. For the layperson participants in the survey, they were unaware of the numerical values assigned to each statement and were required to select only those statements with which they were in complete agreement. Accordingly, a numerical value for attitude could be calculated for each layperson involved in the survey.

To perform statistical analyses on the data obtained in our survey, t-tests were performed to compare differences between total scores and other numerical variables. Chi-squared tests were undertaken in order to compare sample size between groups (mostly between country but also between gender and answers). Analyses using correlations and multiple regressions were performed to assess which attributes (e.g. gender, social status, level of education) were predictors of attitudes towards anatomy or knowledge of anatomy.

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