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Title

Views and perceptions of anatomy educators on medical professionalism: a mixed-methods study

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Abstract

Background

Integrating medical professionalism into the core curriculum remains challenging for many institutions, particularly in today's globalised context. This difficulty arises partly from the complexity and ambiguity surrounding the definition of medical professionalism. Additionally, it is crucial to consider the local and global context and define professionalism within a cultural framework. Thus, the aim of this study is to explore the knowledge and perceptions of anatomy educators from central European universities (Zagreb, Masaryk and Pécs) and the University of Cambridge on medical professionalism through the lens of local context and culture.

Methods

A cross-sectional study was developed, and data were collected utilising a survey tool conducted by the Erasmus+ Strategic Partnership project, LEANbody (Project number: 2021-1-HU01-KA220-HED-000027542). The collected data were analysed both qualitatively and quantitatively. Purposeful sampling was used for including the study participants (n=16) who were anatomy educators from above mentioned institutions.

Results

The educators were asked to define "professionalism". Summative content analysis of their answers uncovered six recurring sets of keywords. Latent content analysis was used to analyse educators' responses on the distinction between professional values and professional behaviours, three categories and nine subcategories emerged as part of one overarching theme '*The Interplay between Professional Values and Behaviours in Healthcare*'. A self-reflecting framework was developed to focus on the connection between professional values and professional behaviour in the healthcare context. Almost 75 % (n=12) agreed that there

are cross-cultural differences in the definition of medical professionalism. Most educators felt that students' multicultural backgrounds, religious beliefs, values, sex and gender significantly influenced their approach to anatomical dissection. Regarding the existence of a governing body that would determine guidelines for medical professionalism, only the participants from the University of Cambridge responded in the affirmative.

Conclusions

This study showed that there would appear to be an urgent need for anatomy educators in several central European universities to enhance their knowledge on professionalism, discuss and agree on creating common terminology through the lens of European context and culture. This improves the understanding and practice of medical professionalism along with its application to anatomy curriculum development and teaching practices.

KEYWORDS

anatomy, professionalism, professional values, professional behaviours, reflective pedagogy, qualitative

BACKGROUND

Professionalism in healthcare within anatomy classroom

Professionalism is a fundamental competency for medical practitioners and has been incorporated into medical education in various forms since the inception of the profession. (1–4). Traditionally, professional attributes and behaviours have been observed and learnt through role models (1). While the presence of role models continues to be vital in fostering professionalism, relying solely on this informal approach is inadequate to address the increasing complexity of medical practice and the diverse cultural, multilingual, and

socioeconomic backgrounds of medical students, educators, and their patients (5). As a result, in recent decades, professionalism has been explicitly recognised as a core competency in undergraduate and postgraduate medical education programs around the globe (6). It seems widely accepted among educators that professionalism should be explicitly taught and assessed as a distinct subject. Nevertheless, integrating medical professionalism into the core curriculum remains a challenge for many medical schools (7,8). This is partly due to the complexity and ambiguity surrounding the definition of medical professionalism, which is influenced by various factors, including societal and cultural contexts, ethical norms, national and institutional policies, as well as personal values and beliefs. Additionally, there are challenges in promoting continuous self-directed development among trainees for future revalidation (7–9). Despite these challenges, the literature indicates that anatomy courses, particularly dissection-based ones, offer a unique opportunity for medical students to learn many core principles of medical professionalism right from the start of their studies (3,10). Furthermore, these studies propose models for integrating the teaching of medical professionalism into the core curriculum (3,10,11). Developing and integrating effective curriculum remains a dynamic process that demands continuous refinement and cultural adaptation at both local and global levels. Such development and integration may prove to be rather challenging due to a shift in the higher medical education context which is increasingly globalised (12). The higher medical education context has become more multicultural and multilingual, and there is an urgent need for educators (including anatomy educators) to give serious consideration to how they want to define, agree, and practise medical professionalism in such a complex context (13). Both educators and students need to develop a "glocal" approach by thinking globally and acting locally. Glocal competence is described by Dimitrov as "the ability of instructors to interact with students in a way that supports the

learning of students who are linguistically, culturally, socially or in other ways different from the instructor or from each other" (14). Educators need to acquire a wider understanding of cultural diversity through developing intercultural perspectives to provide inclusive teaching in this complex context. It is essential that anatomy educators are aware of the opportunities, possibilities, and challenges posed by the incorporation of medical professionalism in their curricula, minding both national and international students (13). In the context of some Central European universities and University of Cambridge that provide medical education to international students, a survey tool was developed to assess the current perceptions of anatomy educators on medical professionalism as a part of their anatomy courses. This survey tool was developed as a part of an international collaboration in the project LEANbody (LEAN in Medical Education: Reaching for Quality Management Tools to Teach Human Anatomy Effectively in a Multicultural and Multilingual Learning Space; project number 2021-1-HU01-KA220-HED-000027542). As indicated by previous authors (7,8), integrating medical professionalism formally into anatomy curriculum may prove to be a challenging task, especially in medical schools with anatomy teaching traditions that are rooted in traditional historic frameworks. Therefore, this survey tool was developed to prompt the discussion on how anatomy educators perceive professionalism, what they consider to be professional practice within the context of central European universities and why this is the case. It is hoped that the findings from this survey will assist anatomy educators to enhance their knowledge of medical professionalism, agree on common terminology that improves the understanding and practice of medical professionalism, and apply this to their anatomy curriculum development and teaching practices, which would contribute to the broader educational community, and ultimately improve the professional development of both medical students and educators. The authors of this article are hopeful

that this article might help to eventual integration of formal teaching of medical professionalism into anatomy curricula at these institutions and possibly institutions from similar contexts.

Aim

The aim of this study was to explore knowledge and perceptions of anatomy educators from selected central European universities and University of Cambridge on medical professionalism through the lens of local context and culture.

METHODS

Study design

A cross-sectional study was conducted using a mixed-methods design (15). Data were collected using an online questionnaire during the period between 24th May and 7th June 2024.

Participants

All 16 study participants were educators currently teaching anatomy in their institutions and members of the LEANbody project. The institutions represented were Masaryk University (Czech Republic), University of Zagreb (Croatia), University of Pécs (Hungary), and University of Cambridge (United Kingdom) (Figure 1).

Figure 1 shows the distribution of educators based on their university affiliations and countries. Throughout this manuscript, while the term “anatomy educators” is used for all survey participants, their roles within their departments might differ, as they could be a head of department, lecturer, clinician, or a postgraduate student who assists with teaching.

Teaching experience also varied between educators. Of all 16 educators, 9 (57%) had taught

anatomy for 10-15 years or more, 2 for 5-10 years, and the remaining 5 educators (30%) for 0-5 years. Seven (44%) educators had not received any formal pedagogical training.

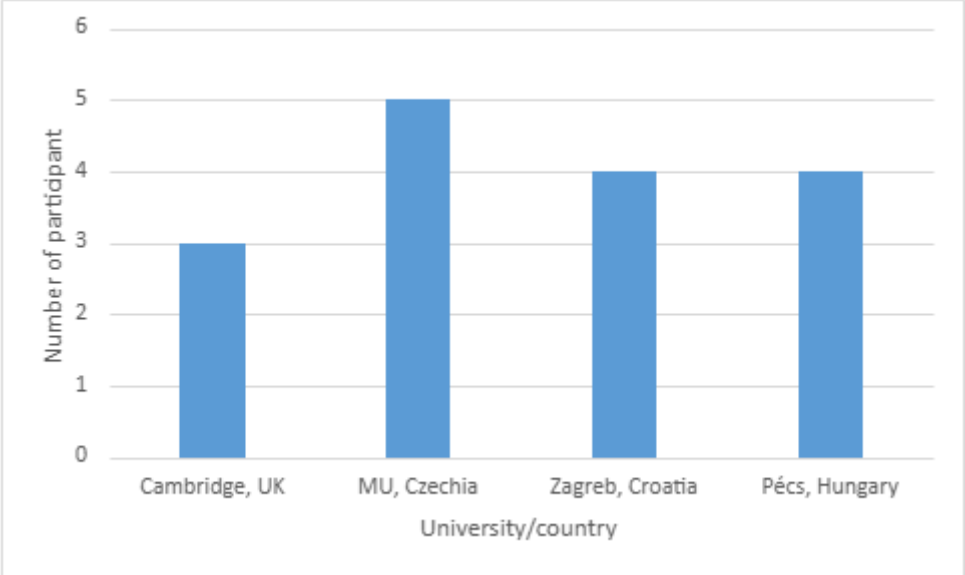


Figure 1 Distribution of participants according to country and university affiliation.

Data collection

All educators from the four universities that fulfilled the inclusion criteria were included using purposeful sampling. Educators of the LEANbody project were approached to complete a survey questionnaire. The questionnaire contained both closed- and open-ended questions covering the following areas: (i) general characteristics about the participant, such as the university where the educator is active at the time of the study, country, teaching experience, and teacher training; (ii) professionalism – definition, frameworks, and guidelines; (iii) teaching and assessment of medical professionalism in their anatomy courses; (iv) professionalism competencies in anatomy education and their assessment; (v) unprofessional behaviour - definition and examples of unprofessional behaviour in students. In total, there

were 38 questions in the questionnaire, of which 25 were compulsory. The questionnaire was offered with an accompanying document containing a glossary and a short introduction with a brief literature review on the topic of medical professionalism in anatomy teaching. This paper presents the results of the analysis of the answers to 9 questions that are relevant to our research question, i.e., from the area of (ii) professionalism – definition, frameworks, and guidelines. Of the 9 questions which were analysed, 7 were compulsory, while 2 were optional.

Data analysis

Data were analysed using both quantitative and qualitative methods. Closed-ended questions were entered into an Excel database from which frequencies and percentages were calculated. Responses to selected open-ended questions were analysed using summative content analysis (16) and latent content analysis (17). Latent content analysis is subjective and interpretive where the relevant text would undergo multiple readings to grasp its overall meaning. In the process of summative content analysis, the data were read several times, after which essential keywords were identified and organised into clusters based on recurring keywords from various respondents. The frequency of keyword usage by respondents was calculated to observe their usage patterns which were then analysed regarding their contextual meaning. Latent content analysis involves a subjective interpretation of the text data, achieved through a systematic process of categorising and abstracting codes and themes. During the analysis phase, each statement that shared a common central meaning was assigned a code. Codes with similarities were grouped and further classified into subcategories and categories. Related categories were then linked to form central themes.

RESULTS AND DISCUSSION

Qualitative analysis

The results from open-ended questions are presented and discussed in this section.

Educators' perceptions of professionalism

To explore anatomy educators' knowledge and perceptions of professionalism, they were asked to explain the term "professionalism". In this specific question, the educators provided concise explanations. From the summative content analysis, six sets/groups of recurring keywords emerged as follows:

(i) Expected behaviour, behave, attitude, deal; (ii) A way, an approach, a protocol, a set; (iii) Adhere, follow, obtain, do, ability, capable; (iv) Values, qualities; (v) Ethical stances, work ethics, respect, equality, committed, integrity, reliability, accountability, credibility, and respect; and (vi) Competencies, skills, standards (see Table 1).

Table 1 Keywords and phrases/sentences used by educators to explain the term "professionalism".

Keywords	**Number of respondents (n=16) (%)**	**Selected quotes**
Expected behaviour, behave, attitude, deal	9 (56)	This is a broad term that encompasses a variety of behaviours.
A way, approach, protocol, set	4 (25)	It's a way you approach what you do.
Adhere, follow, obtain, do, ability, capable	7 (44)	Ability to behave professionally.
Values, qualities	5 (31)	Values and qualities expected in each profession.

Ethical stances, work ethics, respect, equality, committed, integrity, reliability, accountability, credibility, respect	7 (44)	Respect for the opinions of colleagues and students, an equal relationship with respect, work ethics, achieving a high level of expertise in one's own work, respect for ethical principles and a fair way of treating everyone.
Competencies, skills, standards	4 (25)	Competence and skills expected from a professional

The majority of educators (around 60%, n=9) perceived professionalism as varying behaviours (attitude or deal) that are expected to be observed at a workplace. The answers of educators resonate with previous research, which defines professionalism as a set of behaviours (18). Four (25%) educators explained it as a way or an approach of doing the work they do. These answers reflect an evolving professional identity which is a multifactorial phenomenon shaped by the interplay of clinical and non-clinical experiences, expectations, and environmental factors, merging with individual values, beliefs, and obligations (19). Over forty percent (n=7) of educators connect professionalism with ethical principles, which echoes previous research findings that the basic foundation of medical professionalism and ethics rests on trust, truth, human values, and societal responsibility (20). These findings indicate that there is consensus on what defines ethical reasoning and professional behaviour. The connection between professional behaviour and ethical principles can be interpreted as the definition of ethics being in synergy with the concept of professionalism. Ethics is defined as the study of morality, i.e., a careful and systematic analysis of moral decisions and behaviours (21). While 4 (25%) of educators identified professionalism as a set of expected competencies and skills needed to practise a profession, another 4 (25%) educators thought that professionalism refers to the values and qualities

expected in a profession. Our findings are in agreement with previous evidenced-based research that documented the importance of acquiring certain skills and competencies which are crucial to enable professionals to complete their tasks (22), while at the same time, professional values and qualities such as respect and accountability are vital for improving the quality of completing these tasks and are core issues for a patient-centred approach (23). This highlights the confusion surrounding how professionalism is perceived by educators and underscores an urgent need to establish a common definition. One potential solution could be the integration of professionalism into course curricula (24). However, there are challenges connected with integrating professionalism within the curriculum (25,26). Educators should be aware of and in agreement with the terminology connected to professionalism in an explicit way when they integrate professionalism within their courses (27). Educators should remain mindful of the standards of their professional conduct. Upholding professional ethics, values, and standards involves maintaining both personal and professional development through a commitment to lifelong learning fostering both personal and professional growth. This approach emphasises maintaining professional integrity and objectivity, while also adhering to regulations and guidelines for professional behaviour. This commitment requires educators to consistently meet high standards of professional behaviour and act in the students' interests at all times. Based on the results of this study, a tool for long-term self-reflection at the individual level is provided in the following subsection entitled "Reflective Pedagogy".

To delve more deeply into educators' understanding of professionalism, they were asked for their opinion on whether there is a difference between 'medical professional values' and 'medical professional behaviours.' If they believed a difference exists, they were requested to

describe the distinction between these terms. Fourteen out of sixteen educators answered 'Yes' (87.5%).

A latent content analysis approach was applied in the analysis of the data when educators tried to clarify the distinction between professional values and professional behaviours. Three categories and nine subcategories emerged as part of one overarching theme '*The Interplay between Professional Values and Behaviours in Healthcare*' (Table 2). This theme evolved from the comments of educators that mainly dealt with their daily clinical practices. It also indicates that professional values serve as the ethical foundation, while professional behaviours are the practical application of these values in their day-to-day work. The alignment between values and behaviours is crucial for maintaining high standards of patient care and professional conduct. This analysis illustrates the complex relationship between professional values and behaviours in healthcare settings.

Table 2 The analysis of distinction between professional values and professional behaviours, using the structure described by Dahlberg et al. (28).

Text	**Codes**	**Subcategories**	**Category**	**Theme**
Professional values include qualities such as integrity, honesty, compassion, competence, responsibility, etc., whereas professional behaviours refer to how these are shown in the workplace e.g.	integrity, honesty, compassion, competence, responsibility, communicating respectfully to patients, dressing appropriately, telling the truth	Ethical Principles, Professional Competencies, Patient Interaction and personal conduct	Professional Values and Behaviours	*The Interplay between Professional Values and Behaviours in Healthcare*

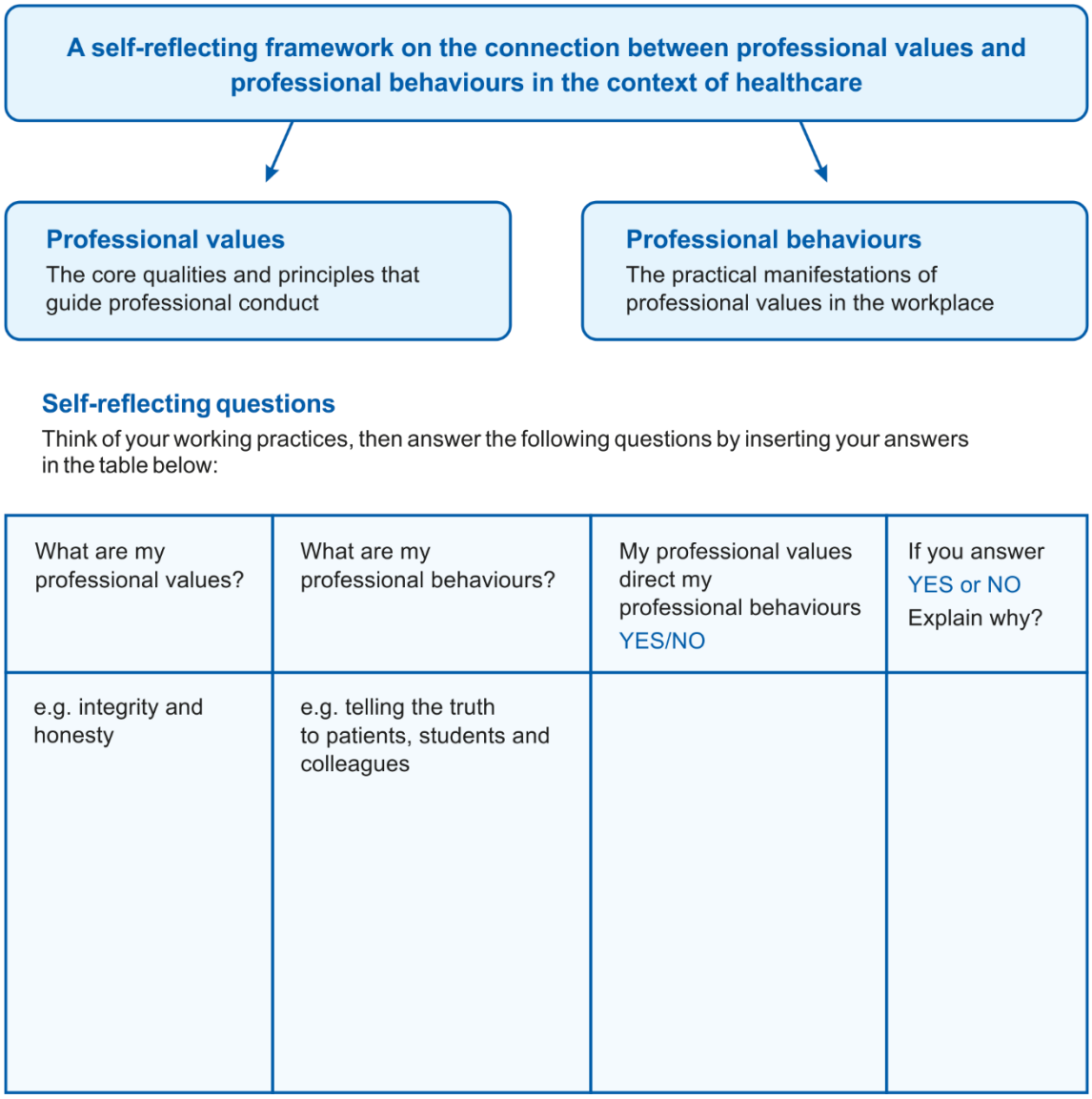
communicating respectfully to patients, dressing appropriately, telling the truth, being calm in emergencies, etc.	and remaining calm in emergencies			

Reflective Pedagogy

Reflective pedagogy emphasises self-awareness in learning, focusing not only on the content but also on the reasons behind learning and the goals to be achieved (29). This approach supports self-reflection as a means to developing critical thinking skills. Reflective pedagogy involves both student and educator reflection on the learning process. It encourages students to think about their learning and progress, while educators reflect on their teaching strategies and their impact on student learning. This approach promotes continuous improvement and adaptation of teaching methods to better meet students' needs.

In the LEANbody project, a framework for healthcare professionals (students and educators) is proposed to regularly reflect on their practices, so that they can pursue continuous professional development. This framework will assist healthcare professionals in understanding not only what they should do (behaviours), but why they should do it (values), thus fostering a deeper commitment to professional ethics and standards (see Figure 2). This continuous self-reflecting approach will provide a foundation for higher education institutions to implement student-centred pedagogy, fostering an environment where students can actively engage in their learning, develop critical competencies, and achieve their full potential.

Figure 2 A framework of the connection between professional values and behaviours in the workplace.



Medical professionalism and culture

Educators were asked to express their opinion on the definition of medical professionalism in relation to cross-cultural differences. Almost 75 % (n=12) agreed that there are cross-cultural differences in the definition of medical professionalism. Four (25%) educators considered that the definition of medical professionalism is impacted by culture (see Additional file 1-Table 3 at the end of this document).

[insert Additional File 1 - 3 here, currently located at the end of the document, pages 33-34]

These findings in alignment with previous research which showed that cross-cultural differences do influence how medical professionalism is defined in various cultural contexts (12,13). The concept of medical professionalism is recognised as a complex social construct that varies across different cultural contexts. While there are universal attributes of medical professionalism, such as integrity, altruism, responsibility, confidentiality, and leadership, the emphasis on these attributes can differ significantly across cultures due to cultural norms, values, and socio-economic factors (9). In Western cultures, medical professionalism often emphasises societal issues and patient rights, focusing on physician autonomy and the physician-patient relationship. In contrast, Middle Eastern cultures may prioritise morality (religious values that stress ethical behaviour), personal character and respect (30), while East Asian cultures emphasise respect, obeying authority, and relational hierarchy (31). These cultural differences influence how professionalism is taught and assessed in medical education, with some cultures valuing a more paternalistic doctor-patient dynamic and others emphasising shared decision-making and patient autonomy (32). Studies have shown that while there is a core set of professional attributes that is considered essential across many different countries across the world, the importance of other attributes varies, reflecting cultural dimensions and values (12). This highlights the need for culturally sensitive approaches in medical education and practice to ensure effective communication and equitable care delivery across diverse patient populations.

Cadaveric dissection has a long history in the teaching and learning of anatomy. Many consider it to be the most beneficial teaching methodology, as it provides hands-on

experience and a deep understanding of the structure of the human body. This method allows students to observe and explore anatomical variations and complexities that are often not visible in textbooks or digital models (33). However, because of the complex context of today's "glocal" classrooms with diverse norms, values, beliefs, and cultures, ethical dilemmas may occur during cadaver dissections. Therefore, in this study, educators were requested to answer the question *"Can you think of any possible ethical dilemmas that could arise during the teaching of anatomy due to cross-cultural differences in the definition of medical professionalism?".* Most educators 14 (88%) thought it is likely that ethical dilemmas could happen during anatomy teaching because of the multicultural nature of glocal classrooms. Nearly half of the educators agreed that students' cultural background impacted how students maintained professionalism while working with cadavers. Most educators felt that students' cultural and religious beliefs significantly influenced their approach to anatomical dissection, particularly with regard to viewing or touching bodies, especially the genital organs (34). Educators reflected on how their students' culture, norms, values, religion, sex, and gender shaped their interactions with bodies and their handling of deceased bodies (see Additional File 2- Table 4 at the end of the document). These results are in line with previously reported findings regarding ethical dilemmas that are connected with cadaveric dissection as well as body donation (35,36). Establishing global educational standards on professionalism can facilitate communication among students and institutions on how to approach, dissect, or bury bodies, even though local contexts can influence these practices.

[insert Additional File 2-Table 4 here, currently located at the end of the manuscript, page 35-36]

Quantitative analysis

The analysis of closed-ended questions is presented in this section. Table 5 contains a summary of responses to selected closed-ended questions from the area (ii) professionalism – definition, frameworks, and guidelines. Each of the questions (represented by a row in Table 5) was always followed by an open-ended question that asked respondents to specify or elaborate on their previous answer when they had answered 'Yes'.

Of all the respondents, 3 educators replied 'Yes' to the question asking whether there is any global model of medical professionalism that is acknowledged worldwide, 3 educators replied 'No' and 4 with 'I don't know'. The following models were mentioned when the educators were asked to elaborate: Vanderbilt University School of Medicine, University of Washington School of Medicine, University of Queensland School of Medicine, and Mayo Clinic and Mayo Medical School, World Federation for Medical Education, Physician Charter.

Table 5 Distribution of responses to selected open-ended questions from the questionnaire's area (ii) professionalism – definition, frameworks, guidelines.

Question	Number of responses (%)		
	Yes	**No**	**I don't know**
Is there any global model of medical professionalism that is acknowledged worldwide?	3 (18.75)	6 (37.5)	7 (43.8)
Is there any governing body that states a medical professionalism framework for medical education institutions in your country?	6 (37.5)	4 (25)	6 (37.5)

Does your Medical School/Faculty/College have any formal document that states the values and/or rules of conduct of medical professionalism that should be adhered to by all the students?	6 (37.5)	3 (18.75)	7 (43.8)

It is questionable whether it is even possible to achieve a 'global model of medical professionalism' in view of the many cultural and socioeconomic differences across the globe (9,12,13). The educators who provided some examples of 'global models of medical professionalism' included models created by western-based higher education institutions and federations either from the USA or Australia (37,38). One educator mentioned the Physician Charter. Presumably, this is the charter created by the American Board of Internal Medicine, American College of Physicians and European Federation of Internal Medicine (39). Although this charter is endorsed by some healthcare organisations from Asia, it cannot be defined as being acknowledged globally (40). The assumptions about the answers that some global standards on medical professionalism do exist could be influenced by the varying cultural backgrounds of the participants (32).

The educators were asked one Likert scale-type question. The first statement was to find out whether the respondents think that their anatomy department adheres to the medical professional framework for medical institutions in their country (Figure 3A). Most educators thought that their anatomy department adheres to the framework (12 participants answered "strongly agree" or "agree"). In the previous question of the survey (Table 5, row 2), however, only the educators from University of Cambridge responded that there is such an

existing framework in their country.

The second statement asked whether the respondents think that their anatomy department adheres to the formal document given by their Medical School/Faculty/College which states the values and/or rules of conduct of medical professionalism that should be adhered to by all their students (Figure 3B). The responses were not homogenous. Two out of four educators from University of Zagreb agreed that their anatomy department adheres to the formal document that is provided by their school regarding rules of conduct of medical professionals. Half of the educators (8) could not decide whether their department adhered to such a document. There were also two negative answers (strongly disagree from University of Pécs and disagree from Masaryk University).

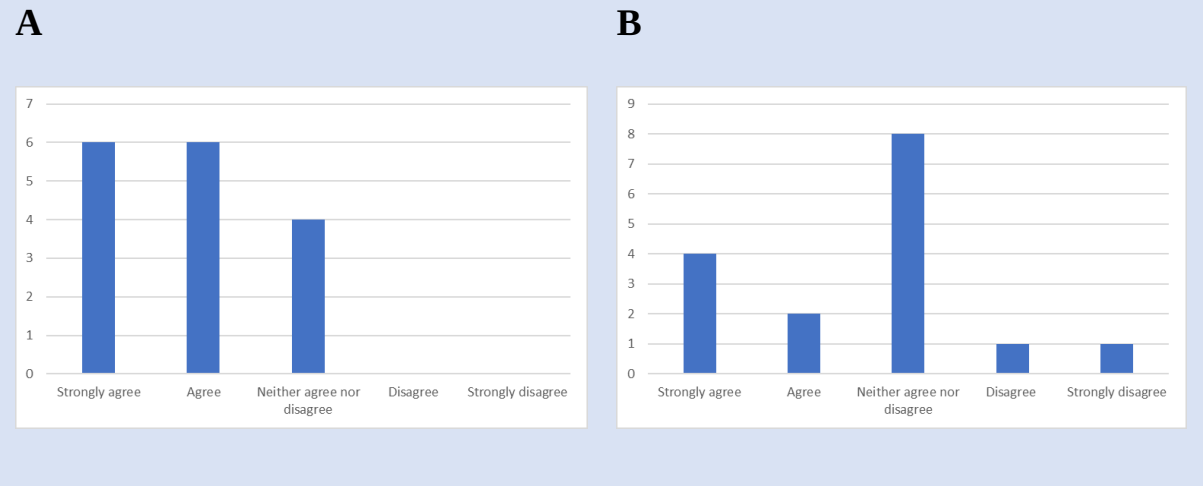


Figure 3 Responses to (A) perceived adherence of anatomy departments to any medical professionalism framework in their country, and (B) perceived adherence to the formal document of Medical School/Faculty/College that states the values and/or rules of conduct of medical professionalism that should be adhered to by all the students.

To survey the current state regarding the governing body and document that would govern the rules for medical professionalism in their country, the educators were asked whether there is such a body and/or document. The only educators that responded in the same way for this question were the respondents from the University of Cambridge (3 in total), where the UK has a document and governing body that establishes the medical professionalism framework for medical schools and other medical institutions in the UK. One educator from the Czech Republic (Masaryk University) gave the name of a governing body and document. Two more educators (one from Masaryk University, one from University of Zagreb) answered that there is such a governing body providing a document that would contain a framework for medical professionalism at medical institutions of their country but did not name a specific governing body or a document in the subsequent question. The remaining educators answered 'No' (4) or 'I don't know' (6).

Similarly, the educators were asked whether their Medical School/Faculty/College has any document that states the values and/or rules of conduct of medical professionalism that should be adhered to by all the students. Based on the answers, only educators from the University of Cambridge (2 out of 3) and the University of Zagreb (3 out of 4) were able to identify some bodies/documents containing values/rules of conduct of medical professionalism that should be adhered to by their students. One educator from Masaryk University (1 out of 5) stated that 'there are some rules, but I think they are more general'. Overall, there appears to be either a lack of documents that provide a medical professional framework for medical institutions in certain countries or a lack of knowledge on the educators' side regarding this issue at Masaryk University and the University of Pécs. There were educators who replied that they did not know of the existence of such a framework (or even that there is no such framework), and yet in the subsequent question, the same educators

claimed that their department does adhere to this framework. In order to evaluate the accuracy of educators' responses, it would be necessary to find out whether there are such existing national frameworks for institutions from Croatia, the Czech Republic, and Hungary. It is also possible that the question was not formed correctly, and it would need to be rephrased. It could be possible that the educators misunderstood the question, which is a potential limitation of this study. Based on the example of the University of Cambridge, a suitable option for central European universities would be to find out whether there is such a national framework for medical professionalism in their country (32, 41). In case there is one such document or framework in existence in these central European countries, then the institutions and/or departments should review if this document/framework is applied (and/or adjusted) at their institutional and departmental level. If such a document or a framework does not exist in their country, it could be considered to activate academic community and community of healthcare professionals to discuss creation of possible charter of medical professionalism values and attitudes that would be applicable and able to be governed on a national level (42).

In a similar fashion to the national level (and/or building upon it), it may be beneficial to establish a medical professionalism framework and/or codes of conduct related to medical professionalism on institutional and departmental level. The diversity of answers provided by the respondents from the same institution and departments could occur due to the varying understanding of the question, or rather subjective interpretation of the question. The heterogeneous nature of answers could also be connected to a subjective interpretation of possible existing institutional and departmental rules and guidelines when it comes to the topic of medical professionalism (3). It is one of the reasons why a common discussion among (anatomy) educators who are responsible for training of future medical professionals

is essential and should lead to establishing a common vocabulary and set of rules/guidelines regarding medical professionalism that would be understood and practised by educators as well as students.

Limitations of the study

This study was conducted with a low number of participants, which was influenced by the inclusion criteria which limited the number of participants to those who were members of the LEANbody project. It would be beneficial to include more institutions and anatomy educators to widen the pool of participants in the future.

Due to the complexity of the issue, there is no clear explicit definition of terms used in the questions asked, it would be beneficial for future studies to include psychometric experts who could form or validate the questions of the questionnaire to increase the effectiveness of the analysis. Furthermore, the data reflect only the opinions of this particular group of participants in the current study. Therefore, it is not possible to form a cohesive image of the current state in all of the central-European universities that provide education for international groups of medical students.

CONCLUSIONS

This study showed that there would appear to be an urgent need for anatomy educators in a number of central European universities to enhance their knowledge on professionalism, discuss and agree on creating common terminology that improves the understanding and practice of medical professionalism along with its application to anatomy teaching practices.

This would contribute to the broader educational community, and ultimately improve the professional development of both medical students and educators.

LIST OF ABBREVIATIONS

MU - Masaryk University

UK - United Kingdom of Great Britain and Northern Ireland

USA - United States of America

DECLARATIONS

Ethics approval and consent to participate

All participants had provided verbal consent to completion of the survey questionnaire. They had been informed about the purpose of the questionnaire via LEANbody project consortium meetings. They were all aware that their participation was voluntary, confidential, and that they could withdraw from the study at any time. The open-ended questions were not compulsory.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

VD designed the survey tool used for data collection, conceptualised the manuscript, analysed the data quantitatively and contributed to the writing of the original draft.
MR designed the survey tool used for data collection, conceptualised the manuscript, analysed the data qualitatively and contributed to the writing of the original draft.
CB reviewed the survey tool used for data collection and provided review and editing of the manuscript.
LK reviewed the survey tool used for data collection and provided review and editing of the manuscript.
MJ reviewed the survey tool used for data collection and provided review and editing of the manuscript.
AE conceptualised the manuscript, analysed the data qualitatively and contributed to the writing of the original draft.
All authors read and approved the final manuscript.

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Authors' information

Not applicable

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643 **Additional File 1-Table 3** Keywords and sentences/phrases used by educators to explain

644 cross-cultural differences in the definition of medical professionalism.

Keywords	**Number of respondents (n=14) (%)**	**Selected quotes**
Cross-cultural differences	12 (75)	There are likely to be cross-cultural differences; Yes. Cross-cultural differences in the definition of medical professionalism are multifaceted, reflecting deep-rooted cultural values, historical contexts, healthcare system structures, educational approaches, and societal expectations.
Different definitions of professionalism across cultures	4 (25)	There are surely differences in the definitions; Because of cultural differences there are surely differences in the definitions as well; I believe the definition of professionalism is heavily influenced by culture
Expression of respect, compassion	5 (31)	There will be different ways in which respect, compassion, etc. are expressed in different cultures.
Ideas, beliefs e.g. religious, religion, ethical	6 (83)	There are cultural differences, some of them ethical or religious, especially in the Middle East; In some cultures where religion might be a heavy component of culture and even law, the definition will be different than elsewhere.
Same values	5 (31)	Even if the values were the same, the behaviours may be different

Different practices, behaviours, emotions	5 (31)	Even if the values were the same, the behaviours may be different

Additional file 2-Table 4 Keywords and sentences/phrases used by educators to explain possible ethical dilemmas linked to anatomy teaching and learning.

Keywords	**Number of respondents 14 (%)**	**Selected quotes**
Different cultures/ ways/approach to anatomical dissection/education/cadaver work.	8 (57)	Different way of approach of the study material of some students; Students from some cultures may find dissection a very distasteful process and may not be willing to do so as it involves "violation" of a human body; Prejudice against cadaver work; For some countries or religions learning, seeing, touching genital organs could be difficult; accommodating students' cultural and religious beliefs about modesty while ensuring they receive the necessary anatomical education; Approach to anatomical dissection; It could be how certain culture sees cadaver work and dissection - some cultures might be repulsed from doing so because they respect human body as something sacred
Seeing/talking/Touching genital organs is taboo; religious beliefs/learning	6 (43)	In some countries talking about the genitals is a taboo; religions learning, seeing, touching genital organs could be difficult; religious beliefs, taboos regarding genitals;
Different cultures/views/ ethical dilemmas on the deceased body	4 (29)	handling and display of human remains; Different cultures have different views on the need for the deceased to be buried

		within 24-48 hours, or for the deceased body to remain whole, so preservation of the donor could cause ethical dilemmas for some students; Ignorance towards respect for cadavers and human remains, consent and use of donated bodies; It could be how certain culture sees cadaver work and dissection - some cultures might be repulsed from doing so because they respect human body as something sacred
Sex and gender	3 (21)	In....countries there could be problem that gynaecologist is male; equality between sexes, taboos regarding sex/gender

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