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Final Report on the Medical Humanities Mapping

Developed in the Framework of the European Project

ALCMAEON

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1. INTRODUCTION

Medical history teaching is commonly included in the program of medical humanities courses available for undergraduate medical students. The role of medical humanities in medical education responds to the need to connect medical practice with the human dimension of the doctor-patient relationship and extra-scientific values involved in clinical decision-making processes. Medical humanities contribute to improving a fuller understanding of patients, cultures and communities, and the scientific enterprise's social dimension to cure illnesses and develop new therapies. Since the early XX century literature reports the practical utility to have medical students studying medical history, the role of this discipline is essential to understand how the presentation of clinical facts changes through the times and avoid the dogmatic belief that medical truth and scientific knowledge are eternal, through the representation of the excellence of ancients physicians and their testimony of historical changes and past errors. In the 1950s, medical history teaching was redefined. Between the 1960s and 1970s, medical humanities have been integrating medical sociology, medical anthropology, medical ethics, and communication skills to face the new challenges of a new "biopsychosocial" framework of illness and inform clinical practice's moral dilemmas. In light of this new context, the study of medical practice's history and philosophical basis became the essential aim of medical humanities and claimed a new space in the medical curriculum. This change produced possible antagonism and conflicts about the expertise and the competences related to medical humanities in medical education. Tensions among medical practitioners, medical historians, psychologists, ethicists, and social scientists characterised the debate around the subject, especially in the last decades of the XX century, and provoke a certain displacement of medical history in medical students' training. Therefore, the current role of medical humanities in the medical curriculum continues to present some confusion about the competencies required to learners and teachers. Nowadays, medical humanities courses at medical schools are frequently fragmented due to the participation in lecturers' teaching activities with different expertise, each one working on a separated and independent module. In this circumstance, the teaching of medical history has been consistently affected by the lack of lecturers' expertise and the reduction of historians of medicine in medical schools. Medical humanities syllabus can include a plurality of disciplines such as the history of medicine, bioethics, narrative medicine, medicine in literature, medical anthropology and sociology, philosophy and history of science, creative arts such as music, painting, reader's theatre and dance depending on the HEIs involved in medical education. The principal reason for the displacement of the attention toward medical history in contemporary medical education is not merely related to the success of the social history of medicine, the new configuration of doctors' social responsibility or the frequency of the ethical issues of medicine, but to the lack of relevance of "medical classics" consequence of the hegemony of evidence-based medicine. The responsibility of educators involved in medical humanities teaching programs is showing that medical history is an excellent opportunity for evidence-based medical practice because it improves cross-cultural interventions and at the same time promote a continuing reform of health care provision.

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2. AIMS

Our project represents an alternative model of medical history provision and an attempt to overcome the gap between clinical practice and the historical perspective of medical humanities by representing the historical scenarios and integrating historical evidence in specific educational contents. ALCMAEON will collect audio-visual material from digitalising the available collections of a medical museum in Italy, Spain, Greece, the United Kingdom, and Romania to promote the different traditions characterising European medical history and bring the medical museums in the classroom. Our digital collection will be open access and supported through and illustrating educational material to promote the cultural patrimony of university museums among the medical students of the European Union and will contribute to disseminate a cross-cultural model of medicine to face the challenges of future health care services:

1. Design an integrated medical history module for the medical humanities course program included in the medical students' curriculum.
2. Identify the different needs of undergraduate medical students and define specific competencies required to integrate medical history
3. Support the teaching of medical history with a real scenario represented by original elements conserved in the medical schools' museums to increase the role of archaeology, anthropology, and plastic arts in understanding medical history.
4. Design a digital museum collecting material related to the teaching of medical history in the medical humanities course program.
5. Design a training package for medical humanities lecturers to teach medical history.
6. Develop an evaluation toolkit to assess the medical students' competences in medical history.

3. METHOD

Student engagement in the traditional teaching model may be limited to activities in which students work independently or in small groups on an application task designed by the teacher. Class discussions are typically centred on the teacher, who controls the flow of the conversation. Typically, this teaching pattern also involves giving students the task of reading from a textbook or practising a concept by working on a problem set, for example, outside the university. Student engagement in the traditional teaching model may be limited to activities in which students work independently or in small groups on an application task designed by the teacher. Class discussions are typically centred on the teacher, who controls the flow of the conversation. Typically, this teaching pattern also involves giving students the task of reading from a textbook or practising a concept by working on a problem set, for example, outside the university. The video lecture intentionally shifts instruction to a learner-centred model in which class time explores topics in greater depth and creates meaningful learning opportunities, co-creation of knowledge, and collaboration. The videos and any other support educational technologies used 'deliver content' outside of the lecture room. In the video class, 'content delivery' may take various forms: content debate, online collaborative discussions, digital research, and text readings.A redefinition of the face to face activities in this model can include, among other practices, engaging students in the content, using emerging

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technologies, in-depth laboratory experiments, original document analysis, debate or speech presentation, current event discussions, peer-reviewing, project-based learning, and skill development or concept practice. The trigger of all these will be the testimonials given by real doctors about their own professional experiences. Because these types of active learning allow for highly differentiated instruction, more time can be spent in class on higher-order thinking skills such as problem-finding, collaboration, design and problem solving, personal choice and mindset, as students tackle difficult problems, work in groups, research, and construct knowledge with the help of their teacher and peers. Skills and attitudes are targeted. The unit's aim reflects the need to develop the competencies of medical students to make decisions in clinical practice. According to the need to understand the complexity of clinical decision-making, medical humanities offer the students the opportunity to develop attitudes oriented to improve the quality of doctor-patient relationship and raise patient confidence, with a great benefit on its adherence the treatment and satisfaction. The role of humanities in medical education highlights especially the relevance of medical ethics to face the challenges of evidence-based medicine and new technologies that increase the complexity of the choices available for doctors and patients. Anthropology and sociology of medicine contribute to the improvement of patients understanding and their views about health, illness, death, end of life and birth of life, and at the same time the clarify the reasons of medical professionalism, the role of the physician in the public society and its responsibility toward citizen public institutions and medical associations. Literature and arts offer medical students' case scenarios where values and clinical facts are interpreted and represented in different ways and constitute a reference for future generations of young doctors. To improve the quality of care means, develop skills and attitudes to understand and communicate with the patient and share with him information about their clinical circumstances to share decision-making and respect patients' values and medical professionalism. Ethics and professionalism are oriented to promote the quality of doctor-patient relationships and avoid ethical issues, litigations, and patients' dissatisfaction. Competences required to promote the doctor-patient relationship quality pass through the awareness that clinical facts, human values, and clinical decision-making are entangled. The evidence of medicine, the values at stake in the clinical encounter and the doctor's duties are entangled, and medical humanities offer the doctor the opportunity to develop the appropriate attitudes to promote quality. The entanglement of medical humanities is our first principle, and it is the inspiration of the methodological approach used in the project ALCMAEON. The project's methodology introduces the object-based-learning approach, a methodology assigning to the objects a great pedagogical value. The material object plays a relevant role in human beings' lives and is essential in defining a relationship with their environment. The use of senses produces a piece of material information to provide a representation of the world. For that reason, material objects became one strategy frequently adopted from active and experiential learning and constitute an example of the big shift of paradigm in education, from a teacher-centred approach to a student-student centred approach. Active learning is oriented to assign more importance to the student than to the teacher role in the classroom and involved the students in the production of knowledge during the lecture. With active learning, knowledge became a product of the interaction between students and teacher, and students' learning experiences became essential to integrate and support the teaching activities. The integration between teaching and learning consent gives the students a more easy and comfortable association between existing knowledge and new knowledge acquired during the lecture. The ALCMAEON strategy to promote active learning in medical history passes through previous experiences where lecturers have used university museum's collections as support to raise the students' interests and improve their learning process. The use of museums in medical

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education and especially in the teaching of medical humanities has been experienced with the visual arts, especially painting. The idea behind this approach is focussed on the relevance of essential elements of clinical reasoning such as observation and interpretation of visual elements collected during the clinical examination, a very similar learning experience is produced by visual arts. The use of the digital museum as a support of the lecture will consent to the medical students to associate the objects collected and upload on the digital platform with the unit's actual contents. In this way, the lecturer will use the object to elucidate the history of medicine and, though the object's visual experience, will improve the students' skills required for the observation and interpretation of clinical practice.

4. RESULTS

4.1 Mapping curricula

To design the educational material, we reviewed all the existing syllabus related to the medical humanities training programs available in the consortium countries. The review aimed to understand the organisation of all the training programs, including the subject of medical history and explore their contents, to design a suitable material in matter of objectives, methodologies, competences, and ETCS. The mapping permitted to respond to the needs of all the different educational contexts where medical history is thought. Medical humanities programs are different and frequently depend on the Medical School organisations criteria or the institutions regulating medical education. Courses can include different modules and explore very different subjects. Understanding this variety has been essential to design a medical history module integrated into the existing courses of medical humanities offered by the different educational contexts. The searching strategy has been focused on screening all the Medical Schools websites of Spain, Greece, Italy, Romania, and the United Kingdom. Each national research team collected available data and were not available to the lecturer in charge of the medical humanities course or the medical history module. The screening process collected 116 syllabuses: 45 Italy, 32 Spain, 20 Romania, 4 UK, 15 Greece. Data extraction has been organised through an extraction sheet collecting the following information: 1) Name of the course, 2) name of the university, 3) faculty, 3) country, 4) ETCS credits, 5) the number of teaching hours, 6) season, 7) year, 8) course type (compulsory/optional), 9) objectives, syllabus and assessment criteria, 10) methodologies, 11) department, 12) lecturer expertise, 13) literature. Extraction sheets have been analysed and synthesised to identify commonalities and differences. Synthesis consisted of a tabulation process involving only the relevant information required to address the mapping aims: country, faculty, name of the course, ETCS credits, timing, objectives, and methodologies. Commonalities and differences identified in the synthesis represented the *dos and don'ts* criteria applied to shape the educational material: the five countries included in the project. Moreover, the mapping process addressed the secondary aim to define state of art related to the medical humanities teaching and provide the scientific community with relevant information to assure the progress and the improvement of this multidisciplinary area in medical education.

Distribution of the course in the time of each degree and main disciplines identified in the syllabuses.

In this section, we have screened the syllabus to identify the exact moment where the module of medical history is in the degree and the disciplines associated with medical history independently of the number of syllabuses. In the same syllabus, we identified three different disciplines. For that reason, we collapsed the disciplines into more general categories analysing the title and the

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contents of syllabuses thematically. In Greece, the module of medical history in Greece is thought in the medical schools at two different stages, for graduate students in the course of *History of Medicine* (6) for 1st-year medical students (4) and 2nd-year medical students (2), as *Epistemology, History and Ethics of Medicine* (1), for postgraduate 1st-year students (4) and 1st year (5). In Greece at the school of medicine and inter-university postgraduate programs, *History of Medicine and Biological Anthropology: Health, Sickness and Natural Selection* (6). In Italy, the module of medical history can be integrated to different disciplines such as *Human Sciences*, can be integrated into the following courses: *human and Clinical Anatomy (4), scientific methodology (4), the psychology of communication (2), evidence-based medicine and bioethics (2), history of medicine (7), human and health sciences (11), human sciences health policies and health management legal medicine(2), legal medicine (3), bioethics and history of medicine (2), histology embryology and history of medicine (2), human sciences and linguistic knowledge (2), introduction to medicine (2), social ethics and bioethics (1), cultural and social history of medicine (2), medical humanities (2).* All the syllabus related to one course identified are available for undergraduate students at 1st year (22), 2nd year (8), 3rd year (5), 5th year (1) others are not related to a medical degree. In Romania, medical history can assume the format of the *history of medicine (15)* or be integrated into *behaviour studies (2)* or *medicine and culture (1).* All the medical history courses are thought at the 1st year (15); others are not specified. In Spain, medical history is integrated into the following courses: *philosophy and medical history (1), history of social science documentation and medical terminology (2), history of medicine (5), medical humanities (1), introduction to health anthropology (1), demography and medical history (1), medical history bioethics and communication (1), research methodology and documentation (10), history and methodology of medical research (2), history of medicine and bioethics (1), introduction to health sciences (1), medical history theory and method in health sciences (1).* Year 1st (15) year 2nd (3) year 3rd (4) other (8) is not specified. The medical degree in the UK can be traditional (6 years) or include an intercalate program (5 years + 1 intercalate). A brief analysis of the websites for medical courses in the UK showed that all medical schools emphasise professional development, especially about clinical encounters, as a central part of medical training. Besides, subjects such as medical law and ethics are taught at all universities (though not necessarily part of the schools' advertisements). Medical students, therefore, necessarily interact with medical humanities in some regard, but there is no consistency across UK medical education concerning how that takes place. Many universities are explicit about their offer of medical humanities. For example, the University of Cambridge includes medical humanities as part of the course for all students: in Year 4, 5, and 6, as part of Review and Integration weeks, there are a series of guest lectures on the 'Humanities and Medicine' with invited speakers from the university and beyond alongside other modules. Several universities offer intercalated degrees in medical humanities or medical history, or other related subjects (Birmingham, Bristol, Cambridge, Exeter, Leeds). At the same time, it is unclear from many university websites that any medical humanities are explicitly offered at all (UCLan, Hull York, Lancaster, Liverpool, Newcastle, Oxford).

Number of ETCS and hours of lecturing

In Greece, when the course is only focussed on medical history corresponds to 2 ETCS (6), but it can take 3 ETCS when it includes medical ethics and philosophy of science, and 7.5 ETCS when it is related to the entire cycle of postgraduate studies. The course extension can be a semester and require 2 hours per week for 26 hours per semester. In the postgraduate course, it can reach 3 hours per week for 39 hours per semester.

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In Italy to course of medical history corresponds to 1 ETCS (19) with a duration between 10 and 12 hours of lecture, 2 ETCS (6) with a duration between 16 and 25, 2 ETCS (3) duration between 30 and 36, 3 ETCS (2) duration 30 -36 hours of lectures, between 4 and 6 ETCS corresponding to 30- 48 hours of lecture, between 7 and 8 ETCS 62.5 and 84.5 hours of lectures. In Romania, the course of medical history has the format if 1 ETCS (2) 1 h per week for a total of 14 hours in a semester, and 2 ETCS in the rest of medical schools (13) for a total of 30 hours of lectures distributed in 2 hours per week, a total of 28 hours 14 seminar and 14 traditional lectures. In Spain, the most common format for the medical humanities course is 6 ETCS distributed in 1 year for 45 and 72 hours (45 lectures, 15 practice generally distributed in 2 hours per week. In the UK, the system is very different, and medical students have access to two different training program, including medical history, the intercalate course in the history of medicine, the intercalate course in medical humanities. Intercalate courses correspond to 120 ETCS, where medical students can stop for 1 year to study one intercalate program focused only on a specific topic.

Objectives

The medical humanities courses' objectives can vary in reason to the combination of the disciplines and the related modules. Not all the disciplines are integrated with the same order and meaning in all the consortium countries. However, we identified a core of subjects that are commonly associated with the module of medical history. Among them, we found: public health and epidemiology, research methodology, medical anthropology, medical sociology, paleopathology, philosophy of science, medical semiology, medical psychology, medical ethics, among the clinical discipline, anatomy, pathophysiology, internal medicine, surgery, therapeutics, psychiatry, anatomy, preventive medicine, medical documentation, medical ethics, the science of documentation, literature, history of art, performing art, law, environmental science, biology, museology, philosophy. All these disciplines can combine different objectives according to the main subject of the discipline integrated. We identified a group of specific competencies corresponding to the objective of the mentioned disciplines:

- To know the evolution of medicine (health and disease) through the different ages, understand the doctor-patient relationship in the different evolutional stages, understand the principle and the existence of alternative medicine.
- To understand the domain of medical language
- To understand public health: i.e., lifestyle, diseases form external factors, the effect of the industrial revolution on public health,
- To understand the medical legislation and the history of the healthcare services, with specific attention on their organisation and financing
- To develop the ability to distinguish between ancient, modern, and rare manuscripts.
- To explore the development of medicine and its relationship with medical practice
    - Historical-conceptual coordinates of the evolution of knowledge and practice of medicine
    - Identification and acquisition of the ideas-guide of the history of medical art in a global vision on the past
    - determining the influences exercised on the development of medical thought and its impact on the other fields of knowledge and human behaviour.
    - Explaining contemporary medicine in terms of its historical development

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    - Explore methodological challenges and historiographical debates generated by working historical ages.
    - Explore the history of medicine in a specific region of the world and medical traditions, include discussion of the global history of medicine.
    - Chronological and geographical perspective, emerging social themes and methodological debates.
- To analyse the milestones of medicine
- To explore human evolution and man adaptation to the environment
- To know the sources of medical history
- To study medical history through the paleopathology
    - Communicable and non-communicable disease in the ancient world
- To know the role of a doctor in the ancient world
- To know the medical history and its relationship with the history of philosophy
    - The impact of philosophy in the biomedical models
- To know the administrative healthcare organisation and the prevention policies
- To study the medical education
- To know the principle of epidemiology and its relationship with public health
    - The general concept of instability of human health over time
    - The interrelation between ecosystem and diseases
    - Development of human health and modern technologies
- To know the main personality and biographies of medical doctors
    - To know the research methodology of medicine and the understanding of the scientific method during the medical history
    - To identify the clinical question and interpret systematic review/meta-analysis
    - RCT evaluation
    - Knowing and locating the general health problems and the development of evidence-based medicine
- To explore the understanding of the medical terminology used and the notions concerning medical history.
- To improve the knowledge of the theory of medical sociology, with emphasis on the study of social change processes, transition, and social development
- To know the development of the healthcare system
- To Understand the historical, social, and cultural factors that influenced the doctor-patient relationship (biological, psychological, and social).

Syllabus

The commonalities of the syllabuses explored in the review identified several patterns in the teaching programs' structures, according to the discipline and the modules integrated into the medical humanities courses. The medical history module can assume nearly two different structures: the traditional historiographic format characterised by the chronological exposition of the different ages and a monographic approach driven by the other disciplines involved in the syllabus. The first one generally includes an introduction to medicine, traditional medicine, medicine from the Romans to the Renaissance, the modern age and contemporary medicine. These chronological periods are generally focussed on the following subjects: Pre-historic medicine, Babylonian and other ancient medical traditions, Egyptian medicine, Pre-Socratic philosophical schools, Hippocratic medicine, Alexandrian School, Greco-Roman period and Galenic medicine, Byzantine-era Arab medicine,

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Western European medicine, Renaissance, Modern medicine, Contemporary medicine. This central structure can be combined with other subjects such as biological palaeoanthropology, history of anatomy, history of microscopy, history of micro-organisms, history of surgery, history of obstetrics, history of public health. Integration assumes more social and anthropological features. It offers an alternative structure where the chronological exposition is substituted with the analysis of the main themes of health and disease: the history of the causes of illness and death, training methods for health professionals, the birth of specialisations, the concept of prevention and the ways and means of implementing it in different periods, the ecological disease concept, natural selection and human pathology, human demographic history and pathologies related to changes in demographic parameters. In some countries, this structure is supported by a monographic work generally done during seminars or as part of the students' active learning focused on the great physicians of medical history or some specific subject related to specific aspects of medical practice.

Evaluation

Generally, summative assessment is at the end of the course and consists of a multiple-choice test or open questions. In some cases, a written paper composition or a presentation about a specific research topic is required to the student as a formative evaluation. In some countries, the participation and the engagement of the student in monographic seminars are part of this formative assessment. In those countries where the students participate in the teaching activities in mandatory, summative evaluation can include their attendance. In the UK, Each taught unit is assessed by a single 3000-word essay. A 10000-word research project assesses the dissertation module, and the research project design module is assessed by a project proposal and poster presentation. It varies per unit but typically comprises a mixture of 2000 and 4000-word essays, presentations, times examinations, and an 8000-word research project (dissertation). In all the circumstances explored, the lecturers are evaluated by students through an anonymous survey generally done through the online platform.

Methodologies

In Greece, they use the Homeric poems to describe and understand the ancient world's pathological conditions and understand the means through which the historical text recuperates the medical past, study of written, visual, and complementary resources. The professor and lecturer teach at the lecture theatre with the aid of PowerPoint presentations; after each course, the presentations are uploaded and accessible at the e-learning University platform. The professor and lecturer try to teach in a dialectic way, providing examples from modern medical practice, exciting thus the students' interest. The PowerPoint presentations provide bulleted information on the subject taught each time, with the aid of photos, videos, and other student-friendly aids. In some cases, students are happy to use the historical archive or the Medical School museum with the aid and guidance of the professor and lecturer. The teaching method is based on a hybrid "Student-centred approach" with the stages of presentation-practice-production, students' engagement and expression of their opinion through targeted questions. The use of multimedia provides useful educational support using photos, videos, virtual tours of museums' websites, or short movies of medical interest. There can be a tour at the Museum of History, or lectures on other specific historical topics in some Greek university.

In Italy, the format used for teaching is the front lecture, supported by other activities to assure active learning, such as seminars and other optional practical activities. During the lecture, the teacher promotes discussion among students on problems related to the physician-patient

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relationship history from antiquity to the contemporary age. Each lesson is accompanied by the projection of visual materials in the form of ppt or images of significant objects to illustrate the historical development of medicine as a practice and culture. The course organises visits to the Museum of History of medicine to promote an object-based historical competence. Lectures exercises in the classroom and the laboratory, practical exercises online at home, and each lesson's end. Participation in webinars or videoconferences in English. Part of the learning assessment includes two interviews for the subjects of History of Medicine and Social Medicine and a final interview on introducing the discipline integrated into the module of medical history.

Furthermore, a written paper will be requested on a historical topic agreed with the teacher, that the students, in groups of two, will have to prepare and present according to one of the following typical methods of the collaborative web (web 2.0): create or expand a Wikipedia entry of relevant topic; create and publish a video on YouTube on a historical-medical topic. The exam will be aimed at ascertaining the actual degree of learning of the contents by the student. The ability to independently develop the knowledge, level of detail and use of clear and appropriate language will be considered.

In Romania, using interactive expository methods based on the analytic syllabus, using literature data and clinical cases examples, including multimedia programs (Prezi®, Powerpoint®), is constant. Active learning is assured through psychological tests, case presentations, lecture, dialogue, critical reading, presentation, teamwork, visits to Museums, projections, text analysis, questioning, reflection exercises, case studies, presentation, student's projects, and essays. In Spain, the training activity is oriented mainly to knowledge acquisition and the presentation of monographic subjects. Although they prioritise the teacher's transmission of knowledge, the student is required to carry out prior preparation of material and further study to supplement the information provided in class. The use of the online platform and the more frequent multimedia is not different from others exposed previously.

In some cases, more room is assigned to the seminars added to support the lectures activities. The seminars will seek to build and develop classroom concepts in an open and collaborative environment. The topics covered in the seminars have been carefully selected to combine and complement the course material. Students will acquire specific skills related to scientific research and develop valuable techniques in research, teamwork and may be required to provide individual presentations on selected topics. UK modules are typically delivered in 11 2-hour seminars, totalling 22 hours of student contact time across the 11-week term. Students are expected to supplement this with their private study, up to 300 hours per module (100 hours per 10 credits). Delivery of seminars differs across modules, but lecturing, class discussion and presentations will be standard. Besides, lecturers run office hours which students are expected to attend and discuss essay plans and the course content. The subject will be taught variously through the following pedagogic mediums: lectures, seminars, tutorials, self-directed learning (including student selected projects).

4.2 Focus groups study

Five focus group have been performed in 5 countries. The study included 31 participants among lecturers' researchers in medical humanities and undergraduate and postgraduate medical students distributed as follows: 5 Spain (FG4SP), 7 Italy (FG2IT), 6 Greece (FG1GR), 6 Romania (FG3RO) 7 United Kingdom. Participants had a lecturing research experience > 1 year and were involved in teaching or research activity with a formal contract at the moment of the FGs participation. The FGs have an extension between 45 and 60 minutes each and had recorded through a digital recorder,

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transcribed and uploaded on the software NVivo for thematic analysis. The qualitative analysis of the focus group identified five main themes: 1) meaning of medical humanities, 2) barriers and facilitators of teaching medical humanities, 3) pros and cons of the e-learning, 4) object-based learning in medical humanities, 5) museum in medical humanities. We will describe each theme using corresponding sub-themes and illustrating each sub-theme with the corresponding codes.

Meaning of medical humanities

Participants in different ways depict the role of medical humanities in medical education. Their aims are different and are depending on the disciplinary perspective inspiring in the lecturer's scope. The first meaning emerging from the discussion is the anthropological character of humanistic education in medicine. Through the history of medical students can have an idea about the scenario where patients lived in addition to the historiographical aspects:

> *to present to medical students is the way people lived, not only what they ate, which means what they introduced in their body, it is also the way they lived with these things […] I do not mind if they don't know when somebody was born, or who found a small operation, I don't mind* (FG3, lecturer, archaeologist, female).

However, medical history offers the opportunity to understand how the patients were thinking and feeling in the past, and not only represent the environment:

> *What the history teaches is the comparison with different human beings with the same thoughts and, in some ways, the same feelings about reality (FG2, postgraduate Medical student, male)*

For that reason, the study of medical humanities is an opportunity to learn how to think about the patients and better understand the medical encounter through the experiences of other professionals who lived their professional life at different ages. Medical history improves doctor communication skills:

> *Medical humanities can help students think and care better for their patients, perhaps through the literature. It consents to understand better several things not experienceable by oneself. Medical humanities indeed improve the intellectual development of students who can write and communicate better (FG4, lecturer, philologist, male)*

Medical humanities are an opportunity to increase the humanities and develop individual sensibility and skills to detect and understand the relationship between doctor and patient:

> *I think it is probably medical education as inculturation is what he (referring to another participant) says. I think another way of saying it is in a way it is not an addition, but it is a kind of exposure of relationships that have always been in existence through medicine's history (FG5, lecturer, doctor, male)*

Barriers of medical humanities teaching.

Barriers identified are related to the teaching activities' organisational aspects, which have a very different structure in each country. The number of students participating in the course is a barrier to the discussion with students and to engage them in the study of medical humanities:

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> *I do not perceive this discomfort with the small groups of students up to 20/25 persons, they are engaged in the bioethics debates and want to express their views, but this is more challenging with the medical history. I failed my repeated attempts to involve the students in the debate, but we cannot ask all the 200 students at the same time participating in a discussion (FG2, lecturer, philosopher, female)*

Lecturers suggest the ideal format to teach medical humanities is in a small group of 20/25 students. In some cases, it would be possible to have a general lecture in the theatre with all the students and then small seminaries to work on monographically aspects of the course. The lecture format is critical to facilitate communication with students and improve their interest in medical humanities. Students' lack of interest may undermine their participation in the lectures, as reported in some country such as Italy and Spain. In other countries, the medical humanities courses are not integrated, but they are split into different and separated modules:

> *It is a bit difficult to respond because here in Thessaloniki. We are more familiar with the system of having one course of medicine, another course of medical ethics, another course of biological anthropology. Meaning that if we blend all these, it might make sense as a medical humanities course, but I do not know how it would work (FG3, lecturer, doctor, female)*

Views about the best moment to include medical history in the medical curriculum are in the early years, and others recommend bioethics at the end of the degree when there is some medical expertise. Someone else suggests diversifying the subject's attention to classical medicine in the early years and a better focus on contemporary medicine at the end of the grade. Other participants put the attention on the lecturer training, depending on his disciplinary competences, the course contents can be unbalanced on the historical or bioethical aspects, and this can exert an influence on the order and the disposal of the modules, healthcare professionals are more inclined to start with medical history be focussed on the development of scientific knowledge and the needs of patients:

> *Sometimes I miss the integration of some subjects more than a historical correlate that cannot be of interests to students. The integration passes for this space assigned to teaching subjects* (FG4, lecturer, nurse, female).

Nevertheless, some participants advocate for a fully integrated perspective where students do not perceive the disciplinary difference and the medical humanities discourse shows all the different angles:

> *A lot of it has to do with the structure, and how much of this is being given to the students in any particular institution, which I know varies enormously. I would say that in terms of the feedback from the students that they don't necessarily notice when I'm teaching them ethics through history. We will have a three hour discussion about whether the concept of pillage is eugenic, and they will see that as being a history discussion, and it's only sort of later when we talk it out, that they realise they've actually discussed a whole load of stuff to do with reproductive ethics and you know women's control over bodies and all of these sorts of things* (FG5, lecturer, medical historian, female)

In Greece, the course's organisation is entirely different and has a solid disciplinary separation, and this influences the lecturer's background who provide the course, the contents taught, which are more objective and specific and miss a more general sense. This specificity is sometimes an obstacle for the student's engagement

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> *It is a bit difficult to respond because here in Thessaloniki, and we are more familiar with the system of having one course of medicine, another course of medical ethics, another course of biological anthropology. Meaning that if we blend all these, it might make sense as a medical humanities course, but I do not know how it would work […] In order to gain the students and keep them active in a medical history course, you cannot overfeed them with details, dates, names, etc. So, you must have reasonable expectations. For example, what we do here in Thessaloniki is that we tell what we believe in a very subjective way – not objective – is essential to remember (FG3, lecturer, medical doctor female).*

Nevertheless, some participants think the disciplinary silos are essential for the quality of medical humanities education, and the role of medical history is essential to understand medical ethics or medical sociology:

> *Then you consider aspects you are interested in transmitting, and you relate them with history. I guess this makes it more interesting the lecture. If you tell them about Hippocrates, they can make connections among the subjects when you explain ethics or professional guidance.* (FG4, lecturer, medical anthropologist, male).

The role of the presentation of contents is significant for the determination of students' interests. In their presence in the course of medical humanities, the distance between the historical account and the practicalities of medicine is a factor undermining their interests:

> *From the angle of medical history, I think there is a lack of attention among medical students when the history became a simple account of different historical events too far from them, or simple accounts of history without any connection to the future medical practice* (FG2, postgraduate medical student, male)

The institutional place of medical humanities assigned by the Medical school is another factor at stake for the successful perception and an appropriate engagement of medical students:

> *The sheer fact that a course is awarded one credit and five meetings mean that the institution itself considers it not to be important. One simply cannot teach Medical Psychology in five courses and, just the same goes for any other type of psychology, which cannot be taught in 14 courses unless, of course, the students do extra work* (FG1, medical psychologist, female)

Facilitators of the medical humanities teaching.

The integration of the different subjects of medical humanities courses is considered a facilitator by participants because it offers the opportunity to offer a multi-perspective explanation of the course contents, integrate the history of the medical tool with the historical events and theories of medicine, perhaps involving a clinician with specific competences about how to use the tools, but with the focus on the whole dimension of the medical humanities:

> *It means to consider the concepts that we are interested in to transfer them from anthropology and bioethics foundation and depict historical facts essential. Do not learn history for aside and the rest on the other side. (FG4, lecturer, nurse, female)*

Participants identified several factors to consider in order to improve the medical humanities teaching someone because they experienced an increase in the students' interests:

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> *I take an example: how medicine was art and slowly became a science, why, and how? I don't mind if they don't know when somebody was born or found a small operation. I don't mind. If somebody wants to be a surgeon, he will look more into the history of surgery, if somebody wants to be a cardiologist, he will study on his own the history of the vascular system and heart (FG1, lecturer, medical doctor, female)*

The role of lecturer background is a factor influencing the style of teaching, and the presentation of topics which hook the students, lecturers with a philosophical background give more room to the epistemological aspects of medical history and the history of theories than on the medical practice:

> *the background, the issue of participation, I can say in my circumstances I am used to give more room to the theoretical evolution and medical history's epistemological aspects. For instance, my background in philosophy is in the history of ideas, theories, and the brain. These subjects in bioethics as well as in medical history are quite interesting, and I am surprised by students' engagement (FG2, lecturer, philosopher, female)*

Nevertheless, for some participants, medical students are generally interested to understand the clinical practice:

> *What counts in medicine is practised, and if we offer the students this touch with the actual past practices, not only theory would be constructive (FG1, lecturer, philologist, female).*

> *But if there's obviously a huge difference between resources that are supposed to be mediated through a classroom, and resources to the students perhaps independently work from which those that you're working on. I don't know but in terms of the bite sized, this is why I brought up this idea of the geographical range that it's in many cases about getting access to things that you otherwise would not be able to get access to and if that has to be in a bite sized information it's slightly different and it in and of itself asks and poses questions of you that are not there in the collections in the text you can go and get the local library and. So, it may well be that this choice of objects subsidising. I know you're not saying dumbed down but you mean dumb down. (What really counts in medicine is practice and if we offer the students this touch with the past actual practices, not only theory would be really helpful (FG5, lecturer, historian of science, female)*

In some countries, factors associated with the teaching organisation and the infrastructure available in human resources and space are essential for students' engagement. Small groups among 20 and 25 students are frequently involved in discussion with the lecturer. The format recommended is a few lectures with all students and small groups for specific seminaries.

The use of e-learning in the teaching of medical humanities

The use of e-learning is a controversial subject of discussion; participants consider the use of online education a risk for the copyright of the educational material, others are concerned about the distance between students and lecturer and consider learning particularly useful with postgraduate then with undergraduate medical students:

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> *I think that e-learning in medical education is useful for a postgraduate student more than for undergraduate in (FG4, lecturer, medical doctor, male)*

The lack of a critical point of views and the capacity to assess the sources of the educational material can represent a limitation for online education and be a discriminating factor for all other non-online sources of information handy for the study of medical history:

> *themselves the presences and absences I think is important and again I think part of the problem with digital archives is that they're so used to digital and they're so used to, you know, they only read an article, if it's an e journal article if it's a physical copy in the basement somewhere, they're not gonna go and get it that they, they haven't yet developed a way of critically thinking about how these materials are put together so any sort of digital service that also provides that extra meta layer is really, really useful for seminar group teaching at least (FG5, lecturer, medical historian, female)*

Advantages of online education depend on the students' responsibility to integrate study with other activities, and the e-learning management system is advantageous as a repository for all the educational material because it offers to the students all the tools available to prepare their test or to communicate with the lecturer and represents a great advantage to improve students engagement:

> *much not for simultaneous teaching but as a deposit of lectures, of PowerPoint presentations so that students can have them when they study to have their exams (FG3, lecturer, medical doctor, female)*

Moreover, the management system consent to offer a more personalised service to the students and offer the lecturer the opportunity to enrich the educational material with other multimedia or to use the flipped classroom approach:

> *I agree about the use of e-learning, upload educational material on a platform can be useful to personalise lectures and tailor them on the real capabilities of the students engaged in the classroom, it can be used as online portfolio of material, and offer video interviews with other lecturers or researchers to have different point of view about a subject, give a polyphonic lecture (FG2, lecturer, philologist, male).*

The methodological approaches to medical humanities teaching perceptions about current methods and object-based learning.

The limitation of the historiographical approach in the teaching of medical humanities to medical students is a factor discussed in several groups, and some participants stress the relevance to link the words to the works and move the students from talking to doing, perhaps involving some historical references in clinical courses and make a connection between medical history and contemporary medical practice:

> *To gain the students and keep them active in a medical history course, you cannot overfeed them with details, dates, names, etc. So, you have to have reasonable expectations. So, for example, what we do here in Thessaloniki is that we tell what we believe in a very subjective way – not objective – is important to remember (FG1, lecturer, medical doctor, female)*

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The introduction of evidence to describe the practice is a good strategy to connect the historical evolution of medicine and the current clinical practices and show how the problems of practice have been solved in the different ages. Most medical students have more pragmatic interests and wish to be involved in the reality of practice since the early stage. Frequently they show a low interest in philosophy, anthropology, or history. The students' assessment using a multiple-choice test is criticised because it does not consent to the student a real re-elaboration of the contents and does not offer the opportunity to express their view.

The multiple-choice test is frequently associated with the students' low interests in face to face lectures; alternative assessment strategies, such as a seminar or oral presentation, can improve the students' engagement. However, the multiple-choice questionnaire is a more effective practice if the assessment procedure involves a huge number of students at the same time, but an appropriate evaluation of competences would require alternative procedures:

> *In the other side, we are used to evidence-based medicine and whit the increase of our medical education we make our decisions on the basis od objective data, statistics, quantitative analysis. Whereas there is a debate about a physio-pathological issue every discussion is oriented to find a practical solution to apply in the professional life. From the point of view of medical history there is a lack of attention in medical students because the relationship between historical account and medical practice (FG2, postgraduate student, medical doctor, male)*

Participation in the seminar is a good indicator to assess the student competencies through their participation, and this factor can be a good indicator of the student's interests and the related skills to afford a subject with more accuracy. Some lecturer takes a picture as a source for the discussion, and the analysis of the contents, other uses movies, in both cases the assessment is focused on the interaction between the students and the source of knowledge, and this is a good opportunity to detect the competences acquired during the course, others suggest the use of flipped classroom approach. Among all the alternative strategies, the introduction of the object examination showed a very positive acceptance because it is a way to introduce evidence in their educational process:

> *So, I think that anything that we can offer them as proof, facts that they can touch, see with their eyes, smell in some cases, things like that* (FG1, lecturer, medical doctor, female)

The use of the object can be a better strategy to catch the student attention and improve their engagement, and the learning process can be organised with an initial moment where the students focus their attention on the object and in a second moment, they switch it to the theory. The learning process involves emotion and can be defined as emotional learning, an approach frequently used in museology:

> *We represented the first surgical intervention through performing art about the direct experience of the objects in Rome. This allowed to have a practice view and to touch the objects and live in historical scenery. Students and lecturers enjoyed the experience. I would like to talk about some possible suggestion about this experience* (FG2, lecturer, lawyer, female)

The object can update the knowledge and be an opportunity for lecturer and students to intervene

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in the learning process actively, their use is a way to turn the student's views toward the facts of medicine:

> *The object receives life from the observer view. It is not me, but what I am doing is driving or helping them extract the more significant benefit from the objects* (FG4, lecturer, nurse, female).

> *So, I think that anything that we can offer them as proof, facts that they can touch, see with their eyes, the smell in some cases, things like that* (FG1, lecturer, archaeologist, female)

Students showed a great interest in the objects and images, the use of iconography in the teaching of anatomy is an example of such as interest, and it can involve the use of a wax model, the classic books, the use of films or literature is another good strategy to illustrate the medical practice and discuss the problem of contemporary medical practice. Painting is another valuable source of images for teaching, and students' practices in museums are positively accepted. Object-based education has always been part of the educational strategy in medical school, its application to describe the anatomy of pathologies is a very illustrative example to contextualise and describe illnesses in an alternative way and improve students' attention and interest:

> *Object-based learning is essential, and objects are beneficial; they are beneficial to depict diagnostic representations and to have objects available that are not directly those of everyday life practice, such as surgical tools, palaeopathological material, or vessels iconography; all these sources offer an outstanding possibility to represent the context, to be focussed on the therapeutical strategies that commonly are not easy to illustrate using a teaching traditional approach, without the help of the sources* (FG2, lecturer, paleo pathologist, female).

Perception about the use of a digital museum in the teaching of medical humanities

The role of the museum in the teaching of medical humanities can be crucial because it helps the students to have an idea of what innovation is in medicine:

> *In a museum, you could see the evolution of a technique. It is like biomedical engineering: If you know the evolution of a device, you know how to make a new, better device* (FG1, lecturer, medical doctor, male)

The museum can contribute to the teaching process with different kinds of supports, paintings, wax models, ancient books, and a digital museum's role to fit with the need to use the museum without moving the students. Object perception can be through touch or view. The digital museum is a great opportunity offered by the technology development and can offer to all the students the privilege to have a museum and illustrate their work using real pieces even though a museum is not available:

> *Frequently I use the arts and painting as support to medical history teaching; when direct contact with the objects is not available, I show them through video support or images. The visit to the museum is essential for teaching support as well as hand on. In our medical history museum, we open the windows display to show what is contained, and we leave to the students the possibility to make a meta-museum to represent the practice* (FG2, lecturer, medical historian, female)

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The digital museum consents to build a meta-museum and create individualised collections of objects that students can use to illustrate their works. It is a kind of support for student-based learning. Students need to know information about the available object, but at the same about what object are not available or are missing in a collection, and are equally important:

> *One of the ways of getting around this is to allow the teacher to interact with the digital resource differently. So for example, giving different groups of students different groups of objects, asking them to come up with a story and then they're able to understand why this group thought that it was that object and that group thought it was this object because they're in a slightly different context so if something that allows someone to go in and parcel it differently presented to different groups of students using different packets of the digital material that if it's designed to be taught from, as well as just, it's not just something that students access it's something that might have mediated access through the classroom teacher that can allow a certain amount of inventiveness to be done again some of it's just daft stuff like you know different cholera posters and you know who's to blame for cholera well it depends whether you read the newspaper articles or it depends if you look at the posters that were going up or if you've watched this little play* (FG5, lecturer, medical historian, female)

The students' active role has to be mediated by a tutor, who should provide the students with all the information required to contextualise the object. The use of technology is useful when is the result of an effort to improve the existing standard of education, but it shows some limitation when it is a substitute for the traditional way to teach:

> *The museum cannot be a simple list of objects but should be a door to have access to the students […] in my case, I am used to walking in the museum space, and I provide them with historical contextualisation before directly observe the objects. After, I leave the students free to walk among the object collection to experience directly how an object is.* (FG4, lecturer, nurse, female).

4.3 Medical students' questionnaires

The survey has been administered in 5 HEIs in Greece, the United Kingdom, Spain, Italy, Romania, except for the University of Bristol, whose organisation of medical history teaching is entirely different and where there is not an official course for medical humanities at Medical School, all the students involved were medical students between the 1st and 3rd year distributed as following: Greece 28, Spain 76, Italy 122, Romania 39, UK 13 (postgraduate students) for a total of 369 under-graduate medical students and 13 postgraduate for a total of 382 participants. The questionnaire involves mapping the students' views about the lecturer discussion in the focus group study. Where possible, the question tries to confirm or deny an assumption expressed by lecturers. They are related to practical aspects useful to design the educational material or the digital platform. The questionnaire aims to identify medical students' need as participants of the training course on medical humanities and their opinion on the teaching of medical history module included in the teaching program. The questionnaire has been administered during the lectures time of medical students under the supervision of a lecturer who informed the students about the aims of the project and the research program's characters, the founder and the international institution involved in the consortium. The questionnaire items have been designed to explore four dimensions: 1) students' competence assessment (Qs. 1-3), 2) meaning and role of medical history in medical education (Qs. 4-5), 3) medical humanities curriculum integration (Qs. 6-9), 4) digital museum (Qs. 10-15). Some questions such as the 11, 13, 14, 15 leave the option to add suggestions, where

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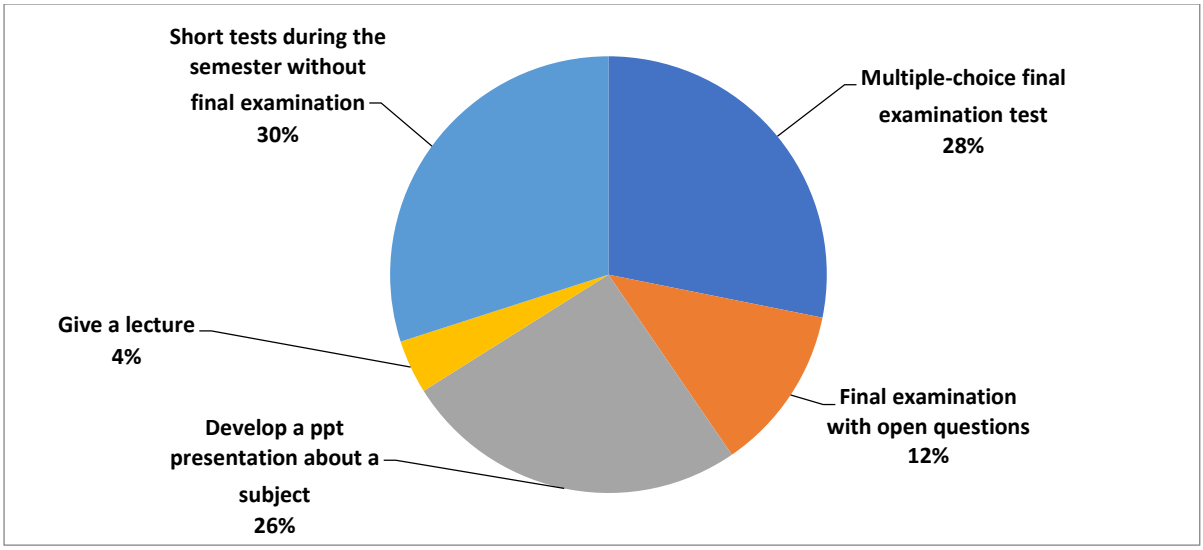
available all the suggestions have been thematically analysed and related themes extracted, where possible students suggestions have been a reference to design the educational material and the methodology suggested to use the digital toolkit.

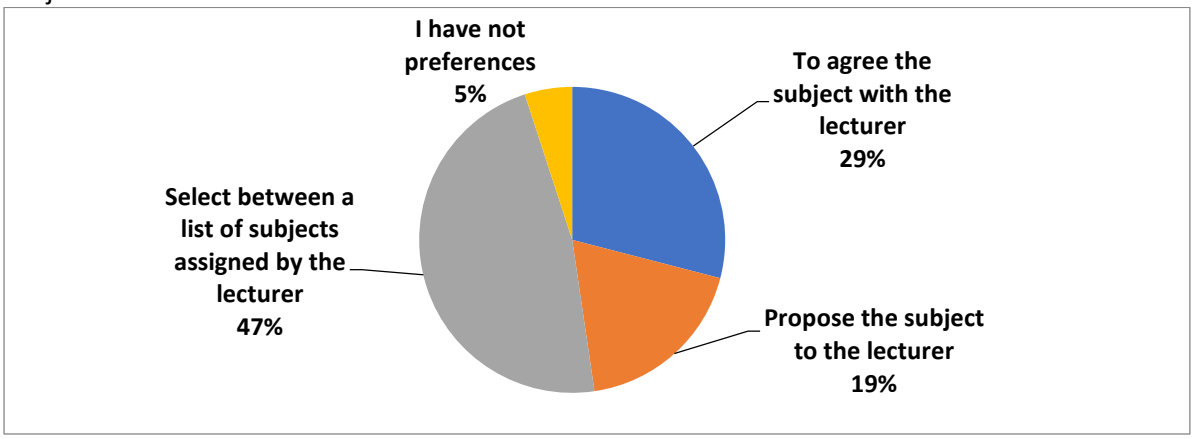
Question 1. To assess your competencies related to the course of medical humanities, which kind of evaluation you consider more appropriate?

Discussion about the assessment criteria in the focus groups and the findings related to the syllabus analysis showed the most used assessment procedures applied to evaluate medical humanities students are: traditional summative (28%) and formative (30%) assessment through the test, develop a PowerPoint presentation (26%), the use of open questions (12%) and flipped classroom (4%). Findings showed that medical students prefer the traditional approaches commonly used in the countries involved in the consortium.



Question 2. If you should prepare an individual work, what do you prefer?

The question explores the students' preferences about developing an individual work assigned generally with a formative or summative purpose. The question explores the differences identified in the mapping curricula and the lecturer's experience in the consortium who use the summative evaluation presentation. The question intends to explore students' preferences about active learning and participation in selecting the assessment strategies. Students prefer to have a list of subjects proposed by the lecturer (47%), or a subject agreed with the lecturer (29%), but some students prefer work on a subject of their choice (19%) and students who do not have preferences about the subject.



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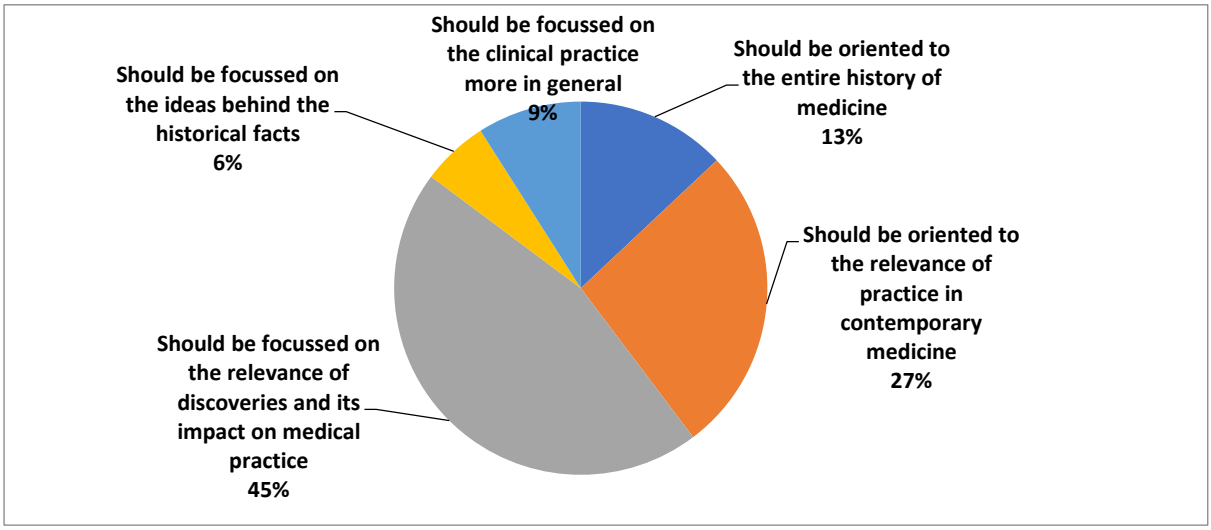
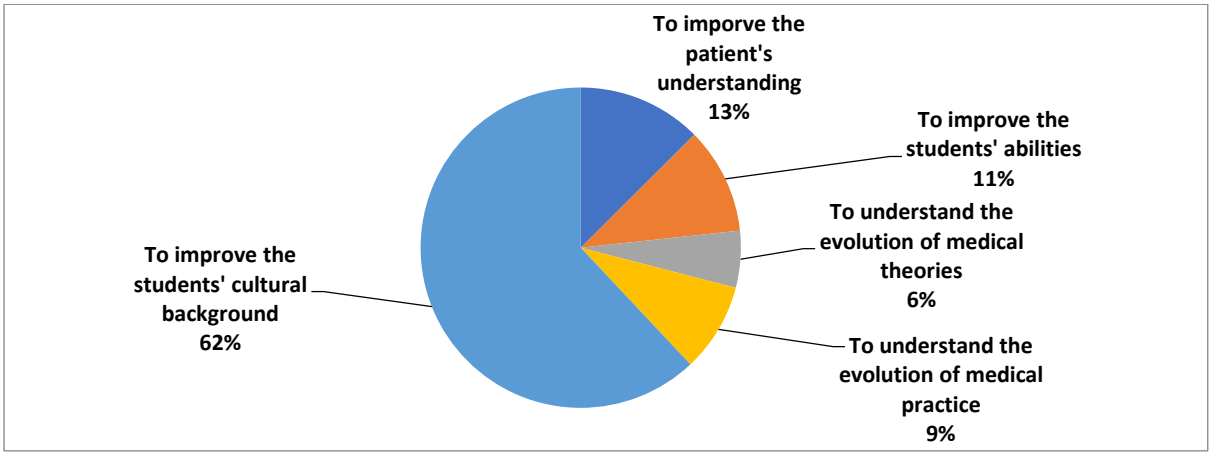
Question 3. What do you think about the evaluation procedure used to assess the teaching of medical history?

The question explores the student's preferences about the medical history module contents in the medical humanities course. The item has been developed based on thematic analysis of focus groups where some lecturer mentioned the disengagement of students was related to the contents of the educational material used in the lecture. The question offers the students' perspective about what they expect from medical history teaching. 45% consider medical history have to connect the most important discoveries of medicine with contemporary medical practice, 27% of students prefer a connection only between history and contemporary medicine, 13% of the students prefer a traditional approach. 9% consider medical history should report just the history of practice and illustrate how medicine has been updated without mention to its the social and anthropological aspects, i.e. the ideas inspiring the innovations, or the history of the social organisations which played a role in medical history. Finally, only 6% consider medical history should concern the ideas behind historical facts.



Question 4. What do you think about the aim of medical history in medical education?

The question explores an issue discussed among lecturers related to medical history's aims and its role in medical education. The 62% of medical students consider that medical history should improve their cultural background, only 12% think it can be useful to improve the patient's understanding, 11% think it can improve students' skills, 9% consider it should improve the understanding of the medical practice, and the 6% the understanding of the medical theories.



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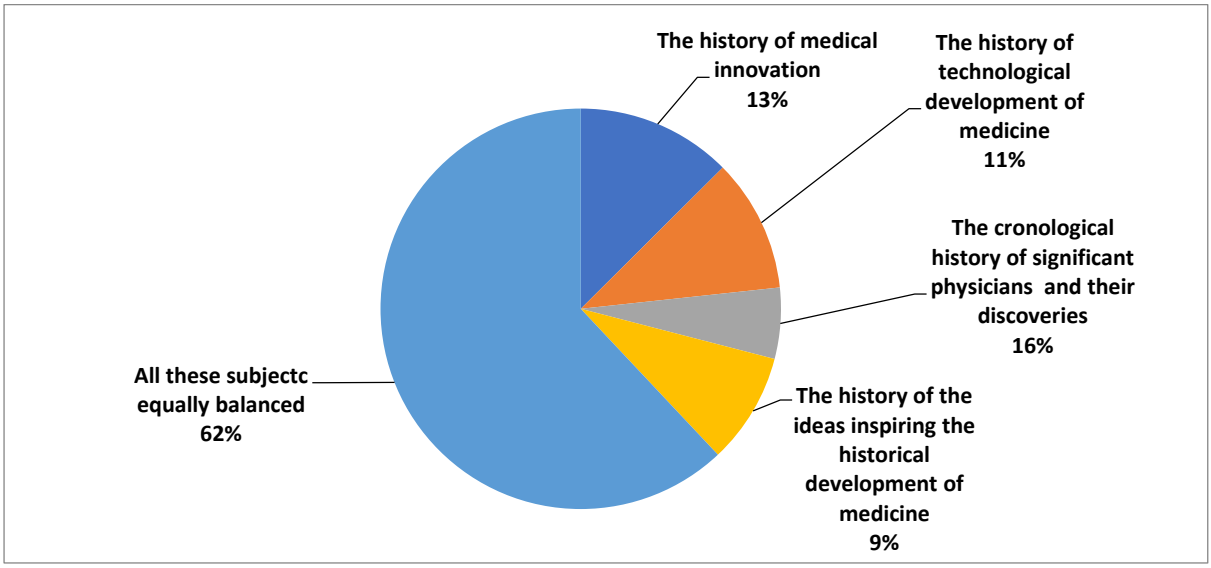
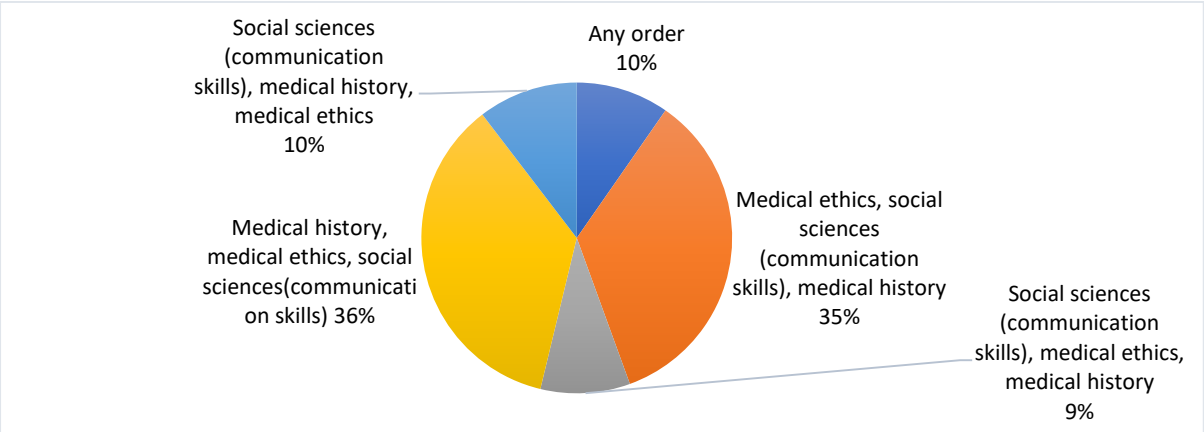
Question 5. Which kind of historical subject do you think should be part of the teaching of medical history?
The question is a further attempt to clarify the dimension defining the role of medical history in medical education. This question explores the contents and the subjects included in the educational material. Students showed interests in a more comprehensive and holistic approach (62%), which integrates the history of medical innovation (12%), the history of technologies used in medicine (11%), the history of the ideas inspiring the enterprises of medical doctors in the different ages (9%), and the history of the most significant physicians and their discoveries (6%).



Question 6. Suppose a course of medical humanities is constituted from a plurality of disciplines such as medical history, medical ethics, social sciences applied to medicine. Which order do you consider can be more appropriate for the syllabus?
This item reflects the extended discussion lecturers had in the focus groups about each module's position in the entire course and the order of disciplines introduced to the students during the course. Lecturers opinions have been different, students expressed their views on the subject confirming the lecturers' views about the subject: 36% of students consider medical history should be the first module of the course and sociology and anthropology of medicine and communication skills the last one, 35% think medical history should be the last module, and the course should be opened by medical ethics followed by social sciences (communication skills) of medicine, 10% of students prefer any order, 10% social sciences (communication skills) of medicine, medical history, medical ethics, 9% prefer social sciences (communication skills) of medicine, medical ethics, medical history.



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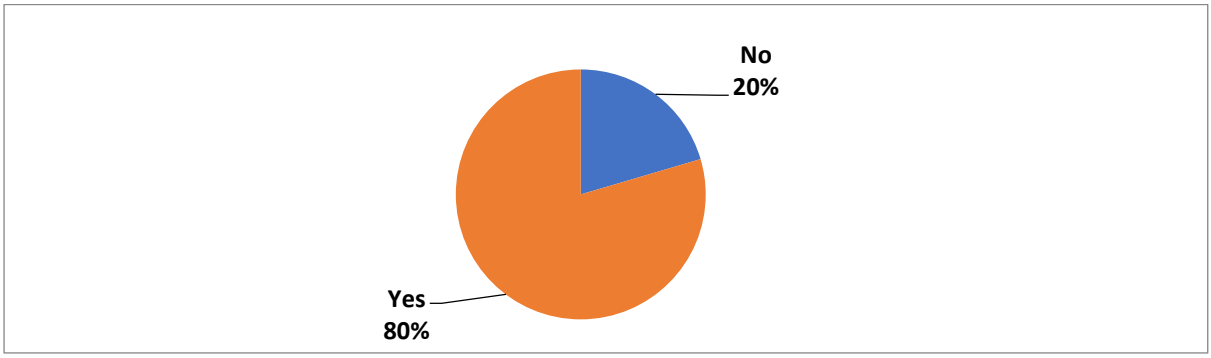
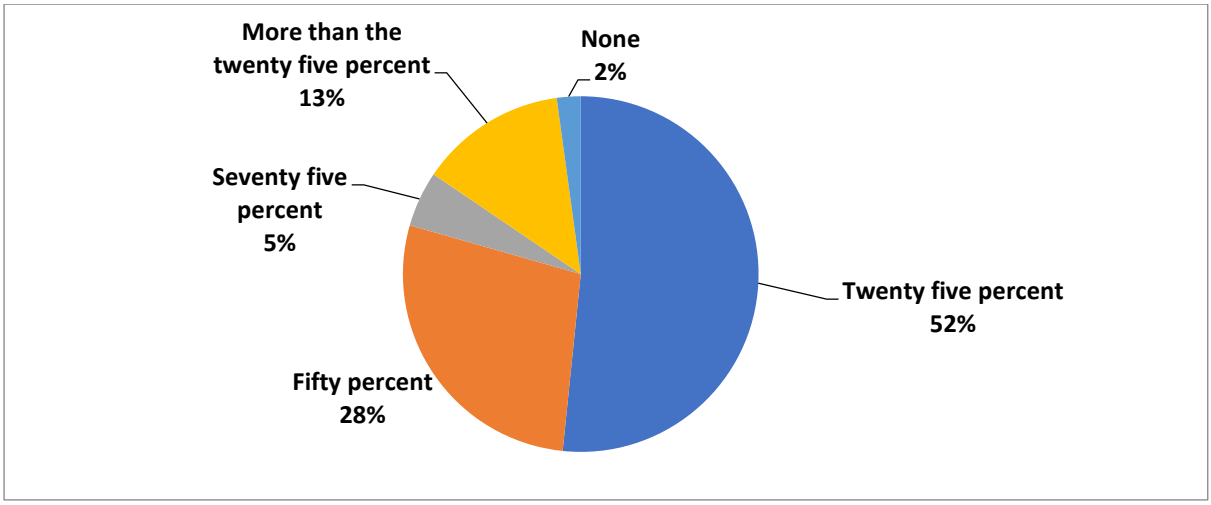
Question 7. Do you think that the organisation of the different contents related to medical humanities, such as medical history, medical ethics, social sciences applied to medicine, communication skills should be oriented to integrate all the disciplines in each argument representing the program?

This question explores the different views of lecturers about the structure of the syllabus and the integration of the medical humanities course's disciplinary contents. The question reflects the dichotomies detected during the mapping curricula where two models represent the contents' organisation: disciplinary and integrated. The disciplinary model considers each independent module silos whose contents are structured following each discipline's structure. The integrated model is referred to a different organisation of topics, where the same topic is explored in all the different modules from a different angle. The students' expectations about integrating modules are unanimous, and 80% prefer the integrated model, only 20% of the traditional disciplinary model.



Question 8. Which prominence should medical history have in the medical humanities education?

This question explores the students' expectations about the space assigned to the medical history in each medical humanities course. 52% consider the space for medical history should not be more than 25%, 28% think it should be 50%, 13% think medical history should have a space mayor than 25%, 5% consider this space should be more than 75%, and 2% do not express preferences.



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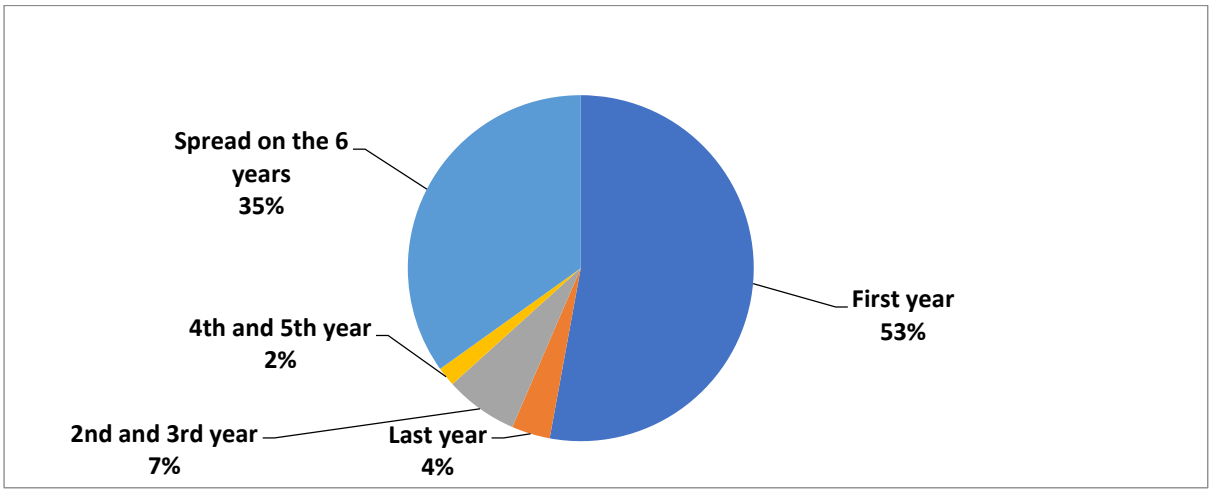
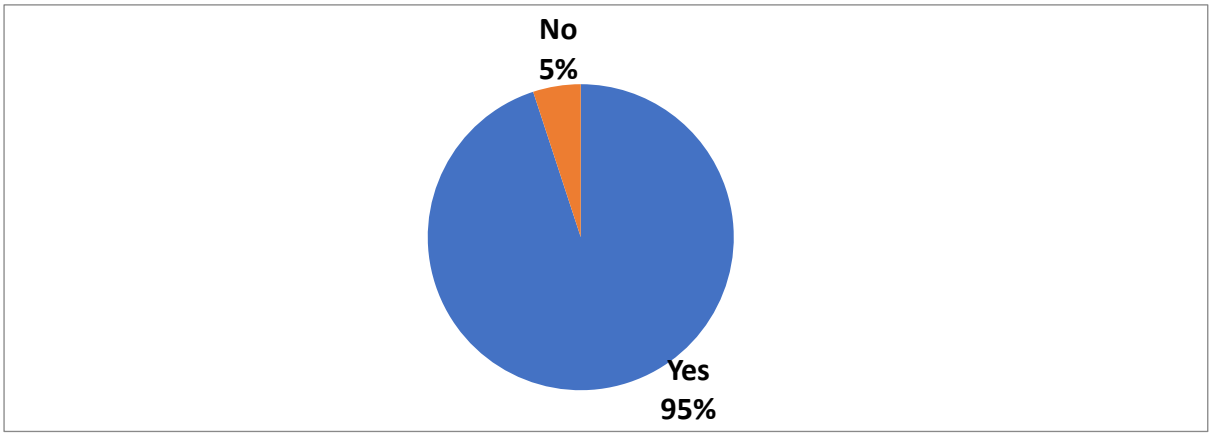
Question 9. Which is the good academic year to study medical humanities?

Another question exploring the nature of the curriculum adopted in medical humanities identified in the mapping of curricula, the traditional curriculum integrating different disciplines, used in most consortium members, and the spiral curriculum spread over the five years, Bristol. Students preferences are oriented toward the traditional curriculum introduced in the first year (53%), a significant number of preferences showed a big interest for the spiral curriculum (35%), a smaller number of students preferred the traditional model but in the 2nd or 3rd year (7%), other in the 4th and 5th, and someone is in the last year (3%).



Question 10. Do you think a medical museum can have some utility to support the teaching of medical history?

The question explores the student's acceptance of the project's main deliverable; the answer is positive and shows the 95% of participants consider using a medical museum to support the teaching of medical history as positive, and only 5% thinks it is not useful.



Question 11. Do you think the digitalisation of the collections available in the medical history museum can help the teaching of medical history?

The question explores the dimension of the student's acceptance and is more oriented to the digitalisation aspects. 79% of the students agree with the digitalisation of the collection's museum, and 21% do not agree. An 18% (for a total of 61 students distributed as follows: 26 SP - 13 UK - 8 RO - 9 IT - 5 GR) of the students who said yes gave some reason about why digitalisation of available collections can be useful to teach medical history. The student's answers were thematically analysed, and the following four themes identified: 1) Practice, the use of the object in the educational material offer the opportunity to introduce the practice into the theory, the availability of the objects is intended as practical support to understand medical history; 2)

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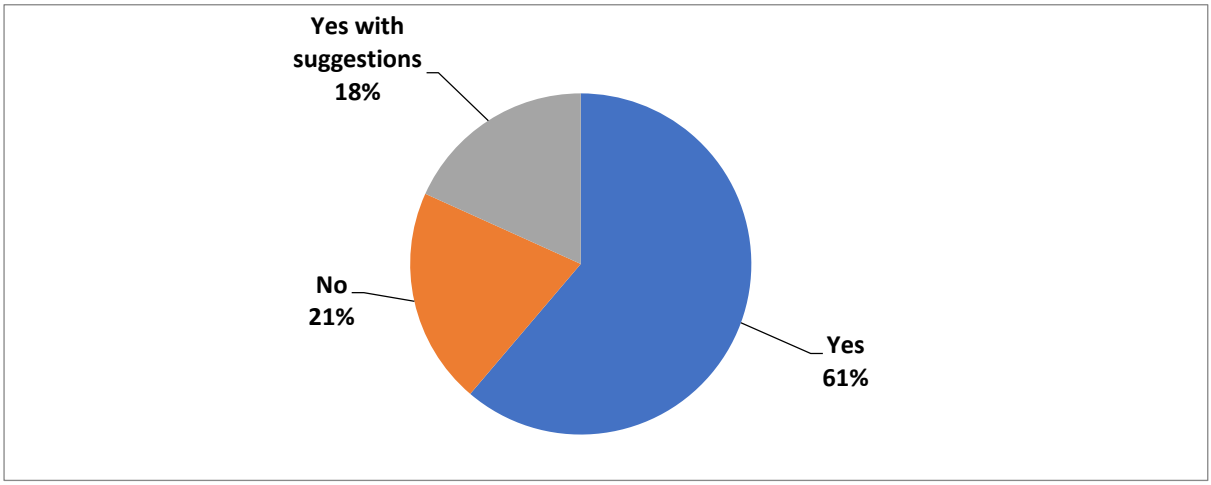
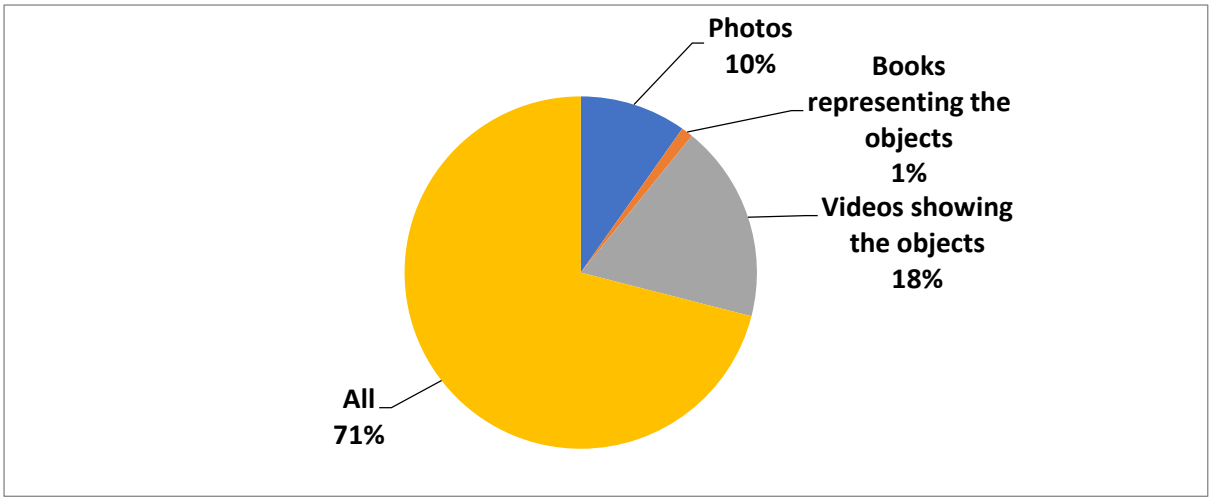
Accessibility, digital collections are available to students of different countries who can accede them and use them. Information related to the digital collection will be available to all the students who are interested in using them for their research or improving the understanding of medical history; 3) Visualisation, digital support consent to visualise the objects and the improve the knowledge of the reality of historical facts. Visual aspects improve the learning process and ad more information to those available in the traditional approach; 4) learning strategy, the visualisation of the object and the direct access to the historical evidence consent to improve the understanding of historical facts, dispose of more information and have better access to all the educational contents. Some students suggest that exploring the objects facilitates the memorisation of the information and improves the students' interests and engagement.



Question 12. Which kind of format do you recommend representing the objects of digital collection available to medical students to support the teaching of medical history?

The question explores the format preferred by students to support the object's representation in the digital museum. We offered the students the option to choose specific multimedia or indicate their preferences toward a general use of different multimedia sources. Students preferences indicated a syncretic use of all the multimedia sources suggested (71%) but expressed their preferences for videos (18%), photos (10%), books (1%).



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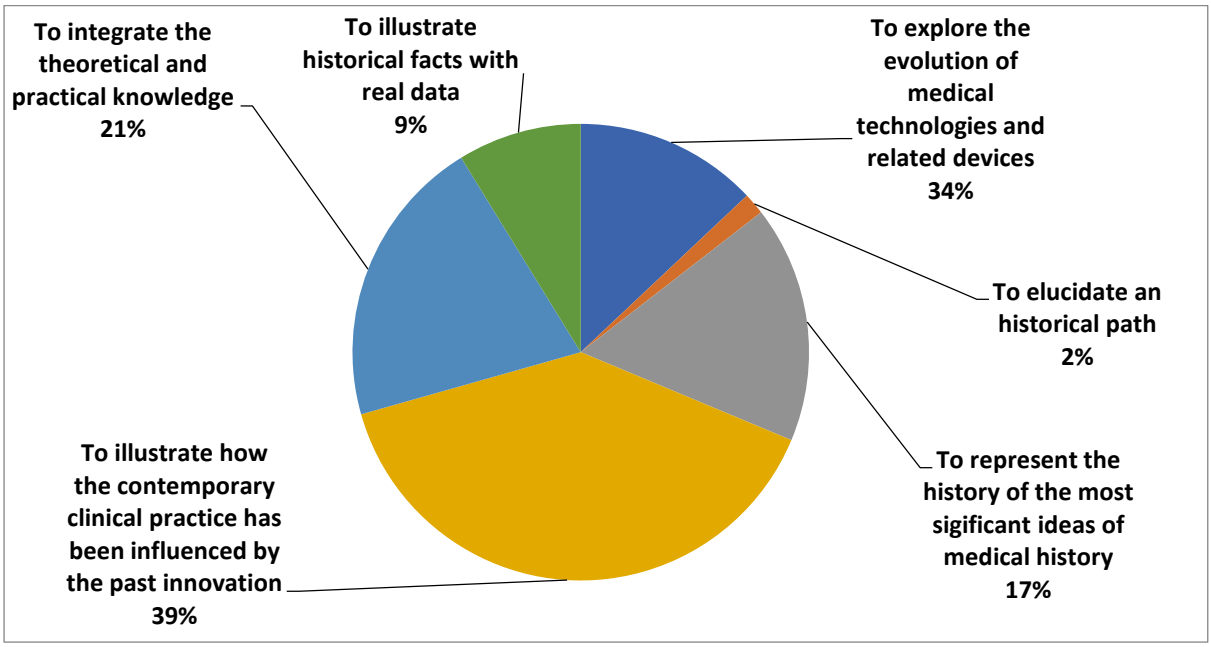
Question 13. Do you have any suggestions about the contents of a digital collection exposed in the medical history museum?

The question explores the students' perception of using the digital collection to improve the medical history module's teaching. A total of 103 students provided their suggestions (29 GR – 13 UK – 45 IT – 16 SP – 0 RO), thematic analysis o the students suggestions identified: 1) format and support, students suggested the use of virtual reality and 3D representation ob the object, all kind of digital multimedia available, including e-books and fragment of books, word documents, power points, and painting; 2) historical evidence, such as medical records of patients to understand better the the history of illness and the characters of ancient patients, surgical tools and other medical instrument to understand better the ancient practice, archaeological findings, skeletal remains, representation of ancient hospitals, socio-demographic characters of the ancient patients; 3) correlation with the contemporary practice, contents included in the digital collections should as much as possible show how they are in correlation with the medical practice; 4) accessibility, the digital collection should be user friendly and opened to another visitors, such as children and non-medical students.

Question 14. In which way a medical museum can support the teaching of medical history?

The question explores the students' expectations about the digital museum's role in the teaching of medical history. We asked them how they would use the digital artefacts available in the museum, and 39% answered the digital contents should illustrate the clinical practice of contemporary medicine and making connections with the evolution of techniques from the past to present. 21% consider the digital museum an opportunity to integrate theory and practice, 17% to represent the history of essential ideas of medical history, 13% to represent the evolution of medical technologies, 9% to illustrate the historical facts with historical evidence, 1% to elucidate the historical paths. The UK students' suggestions



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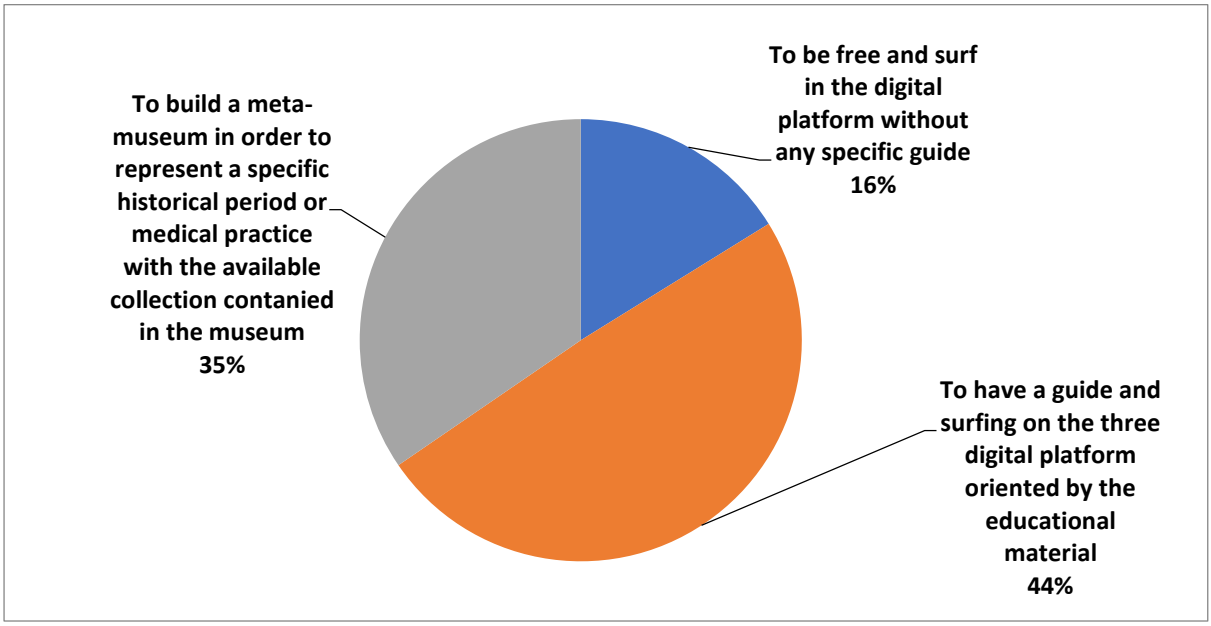
Question 15. What do you expect from using the material available in a digital medical museum to improve the teaching of medical history?

The question explores an aspect discussed in the focus groups about the use of digital museums and active learning support. Discussion about the need for mediation between digital material and medical student highlighted important information related to the methodology developed to use the educational contents. The discussion suggested clarifying students' expectations about the issue and what they would like to use the platform. The 49% of students require mediation and a guide to using the material, 35% prefer to have an active role in using the material and elaborate contents with a more constructivist approach, making a selection of the object to represent better each historical period, 16% claimed they prefer to be free to use the material available how they prefer and use the platform without a specific reference. Among the suggestions, we count with a Romanian student suggesting to respect the chronological order or practical procedure criteria to use the different digital material. Five students from the UK suggested to represent the medical history through 10 objects, integrate the digital museum activities with the learning objects of the training program to engage students and include its use in the formative assessment, represent the social and anthropological context of medical history, integrate the collection with video/lectures to illustrate their meaning and use.



5. CONCLUSIONS

Mapping curricula

The moment where more frequently medical students have a course of medical humanities including medical history is at the first year with a 69.9% of courses, considerably less is the number of course at the second year, with only the 18.1%, the number of courses at the third year accounts for the 10.1%, and only 1.9% of courses are at the fifth year of the degree. We performed the thematic analysis of 116 syllabuses, including medical history as a subject in 4 countries, and we identified 15 themes representing the other disciplines associated with a medical history. The 29.3% of the syllabuses are entirley related to medical history, this is frequent in those universities where there is

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no integrated curriculum, and the flexnerian model prevails.Medical history is integrated for 14.6% of syllabuses to research methodology, 9.4 % human sciences, and 7.7% medical ethics. In the 6% only with medical anthropology, in the 4.3% only with medical psychology, in the 3.4% only with anatomy, or medical semiology. The rest of the syllabuses vary with public health, medical law, introduction to medicine, medical humanities, histology and embryology or medical documentation. The finding showed that 70.7% of syllabuses combine medical history with very different disciplines and frame medical humanities teaching in a multidisciplinary context. Medical history can be combined with almost 30 different disciplines, and the aims of the courses can variate in reason the type of disciplines involved in the same training program. Thus, the aims of medical history teaching in multidiscuplnary contexts are different from those in the traditional flexnerian curriculum. The historiographic perspective is combined with the nature of the subjects included in the medical teaching programs. Thematic analysis findings identified different areas where the historical angle is applied to understanding the medical practice. In several programs, medical history is combined with the evolution of medicine and explanied through the history of health and disease in the different ages and the doctor-patient relationship changes. The clinical relationship is a huge subject and offers different interpretations, i.e., historical, social, anthropological and biological factors. The illness and disease consent to know the principle of epidemiology and their relation with public health, the interrelation between ecosystem and disease, the concept of instability of health and the relationship between technologies and health. More frequently, this perspective includes people's lifestyle in the different evolutive stages and the external factors concurring with the disease. The Exploration of the connection between history and medical practice represents the aim of other groups of syllabuses, especially those where contemporary medicine constructs, such as evidence-based medicine, are combined with the ideas-guide of the medicine and their influence the medical thought. The analysis of the methodologies inspiring the medical practice, and the different medical tradition in other civilisations, including a geographical reference, are frequently used as an objective to illustrate medical history. Health care system evolution is another possible angle very common in the syllabuses mapped in the project. It aims to focus on understanding medical legislation and organisation, with a special interests to the financial strategies, the administration, and the policies regulating the services. The healthcare system evolution analysis offers the opportunity to explore medical sociology theories and focus on social changes processes, transition, and social development. Another big area of interest shown by several curriculm is related to the use of medical history sources and how they can configure medical knowledge. Among the sources explored, we find paleopathology, archaeology, manuscripts and ancient books, collection of medical tools required to understand the milestone of practice in the past. Medical education is another domain of medical humanities connected with the historical perspective, and some program includes medical semiology and the history of medical language to understand medical terminology or to explore the personality and the biographies of the great doctors to identify educational models for students who can identify their self with the great masters of the past. The educational perspective frequently includes the history of philosophy or the history of science. The programs' aims are generally associated with two different structures that we can define as chronological and monographic. The first one is divided into Classical medicine, Renaissance, Modern and contemporary medicine. This main period includes the following subjects: pre-historic medicine, Babylonian, Egyptian and Jewish medicine, Greek medicine in the three different periods: pre-Hippocratic, Hippocratic and Alexandrian medicine. Greco-roman and Galenic medicine, Byzantine, Arabic and Western European medicine, Renaissance and scientific medicine, contemporary medicine. The monographic structure reflects the diversity of aims elucidated above and can assume

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a specific medical speciality format, i.e., forensic medicine, anatomy, microbiology, surgery, obstetrics or some specific medical technology, such as microscopy. Another monographic approach is linked with medical sociology and anthropology, generally oriented to the core subject of health and disease, prevention, human evolution and demography. Socio-economic models associated with pathogenesis. In some country where the chronological approach is a standard, the monographic structure can be linked to specific formative sessions such as seminars, conference, or specific practical activities in museums or lab. Students' assessment is summative with multiple-choice test and open questions, or written essays about a specific topic, the second one more common when the monographic structure prevails. In some programs, most extended dissertations are linked to a project proposal or a public presentation. Formative evaluation can include participation in seminars or practical activities organised during the term. Most syllabuses screened an evaluation of lecturers is included, and students can assess the performance and the quality of the educational contents. Active learning is the standard of all the programs explored and is frequently associated with e-learning platforms to support the students' work in the classroom and at home. The format comes from the traditional lecture in the classroom to other external activities in museum, labs or theatres to watch films or discuss literature.

Focus group study

Findings showed that the function of medical humanities and medical history in medical education is the value of humanistic education through the study of the story, the understanding of doctors and patients and its implication on medical practice. Barriers to the teaching of medical history in contemporary medical education are due to the organisation of teaching, the number of students, and training programs. These aspects constitute an obstacle to the students' interest in medical history. The factors facilitating the teaching of medical humanities are multidisciplinary angle, lecturers' background, and the relation of the program's contents with medical practice. The use of e-learning to teach medical history is controversial, for a side can represent a limitation of all the traditional sources commonly offered by the historiography, conversely can support the students and facilitate the learning process. Object-based learning appropriate because it introduces evidence in the historical account, which can be a factor of interest for medical students. The students' assessment with the multiple-choice test is criticised because it does not promote critical thinking; some alternatives are suggested and involve an active learning approach with students' critical role and their interaction with educational contents. Assessment is a further aspect that plays a role in students' engagement, such as seminars or presentations or flipped classroom approaches. Object-based learning offers several solutions to promote critical thinking and to engage the student in the classroom. The museum can introduce in the learning process several supports such as books, painting, wax models, and collection can be used to develop a student-based approach where student and lecturer interact to contextualise the objects.

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