SAPIENZA
UNIVERSITÀ DI ROMA

E-ISSN 2531-7288
ISSN 0394/9001

MEDICINA NEI SECOLI
Journal of History of Medicine and Medical Humanities
38/1 (2026) 99-120

Received: 27.10.2025
Accepted: 09.12.2025
DOI: 10.13133/2531-7288/3308

Corresponding author:
marta.reichlin@unicatt.it

Integrating Medical Humanities into Medical Education: Insights from a Case Study at the Università degli Studi di Milano

*Marta Reichlin**
Department of Communication and Performing Arts, University Cattolica del Sacro Cuore, Italy

*Sara Agnelli**
Center for the Humanities and the Public Sphere, University of Florida, USA

Luisa Pupo
Department of Health Sciences, University of Milano, Italy

Giovanni Leva
Department of Health Sciences, University of Milano, Italy

Pier Maria Battezzati°
Internal Medicine and Liver/Gastronterology Unit, director, University Hospital San Paolo – ASST Santi Paolo e Carlo, Milan; Department of Health Sciences, University of Milano, Italy

*These authors contributed equally as co-first authors
° Senior/last author

Abstract

This study examines the implementation and perceived impact of the *Medical Humanities* course at the San Paolo Campus of the University of Milan, designed to integrate humanistic reflection within biomedical education. Drawing on twelve in-depth interviews with former participants, the research investigates how early exposure to patient care and humanities-based learning influences professional development. Results indicate that the *First Approach to the Patient module*, which provides supervised bedside experience and guided reflection, was regarded as the most effective component because it fostered empathy, communication, and awareness of the relational dimensions of care. Although theoretical modules were perceived as less directly applicable, the course as a whole was recognized as a meaningful introduction to the human aspects of medical practice. The findings highlight the pedagogical value of early and continuous integration of humanities within medical curricula to support the cultivation of reflective, relational, and ethically grounded professional identities in future physicians.

Keywords: Medical Humanities - Medical Education - Empathy - Reflective Practice

Introduction

The Italian term *medicina* ("medicine"), from Latin *medicina* —originally *ars medicina*, the feminine adjective of *medicinus* ("pertaining to doctors and healing," "medical," "medicinal")— has an interesting etymological history[1]. It derives from the Latin verb *medeor*, whose original meaning referred to "providing," "caring for," or "remedying," from which the more specialized sense of "to heal" later developed. From this verb comes the noun *medicus* ("doctor"), which gave rise to a large family of derivatives, including *medicare* ("to treat"), *medicatio* ("treatment"), *medicamentum* ("remedy, drug"), and *remedium* ("cure").

These Latin terms preserve the Indo-European root **med-*, which carries a wide range of meanings: "to govern," "to think," "to care for," and "to measure"[2]. Interestingly, the root **med-* also also subsists in the Latin verb *meditari* ("to meditate"), thus conveying the idea that reflection is constitutive of any medical task. Its medical, more specialized sense does not refer to quantitative measurement but rather to moderation, a principle intended to restore order in a sick body. It is therefore noteworthy that the very root from which the medical lexicon originates already conveys an intrinsic idea of care. At the heart of the Italian terms *medicina* ("medicine") and *medico* ("doctor") lies not an immediate reference to an action performed upon another, but an inner disposition defined by attentiveness to the condition of the other. The *medico* ("doctor") is thus the one who establishes a relationship characterized by solicitude for another's well-being[3].

While the aspiration to endow medicine with a fully scientific character has often reemerged throughout the Western medical history, it is now widely recognized, at least within the scientific community, that medicine cannot be reduced to the hard sciences. The original meaning of care and attentiveness still resonates in contemporary debates on the nature of medicine. How, then, does such an understanding persist in modern medical education and practice?

If the primary focus of medical inquiry remains in the clinic, an activity not reducible to a standardized, mathematically based procedure like engineering, then medicine inevitably retains a fundamental ambivalence. This tension lies between a rigorous foundation, grounded in the results of the natural sciences (physics, chemistry, and biology), and a mode of practice that is inevitably shaped by a multiplicity of subjective variables.

It is within this discourse that we encounter the medical humanities, which seek to recast medicine not simply as a science but as a *techne*, an art of practice grounded in multiple sciences and inherently situated within a world of values and complexity. Medical humanities is the study of the intersection of health and humanistic disciplines, fine arts, as well as social science research that gives insight into the human condition (such as history, anthropology, sociology, and cultural studies). Medical humanities use methods such as reflection, contextualization, deep textual reading, and

slow, critical thinking to examine the human condition, the patient's experience, the healer's experience, and to provide renewal for the health care professional[4].

This transdisciplinary field offers pedagogical approaches that complement biomedical training within the medical curriculum. Disciplines from the humanities and human sciences —such as history, philosophy, religion, literature, and medical anthropology— enrich the education of medical students, fostering professionals who are capable of addressing complex problems, advancing scientific inquiry, and caring for patients in an increasingly multifaceted health care landscape. In Bleakley's words: "Professional expertise such as stitching a wound, knowing how the immune system works, prescribing a drug or breaking bad news is sterile until applied in an actual clinical encounter to another's flesh, blood, mind and personality that in turn are products of their cultural circumstances. We do not need to conjure a magical humanities potion to enliven a moribund, or fix a misguided, medicine. Rather, we need to articulate how medicine, healthcare and the arts and humanities are co-implied, and then extend translations such that they generate benefit for doctors, healthcare professionals, patients and communities alike on a global scale"[5].

Moreover, the field of medical humanities represents not only a transdisciplinary but also a transnational effort, with a degree of global representation through both well-established and lesser-known programs around the world. In the case of Italy, the literature shows that medical humanities programs do not differ significantly from those in other countries[6].

However, despite some efforts, particularly since the COVID-19 pandemic, there is still no national network of medical educators sharing their experiences. Instead, initiatives remain confined to a small number of universities, and the landscape continues to evolve[7]. The aim of this article is to contribute to the national effort by presenting the implementation of Medical Humanities at the San Paolo Campus, one of the hospital campuses of the University of Milan.

An example of a Medical Humanities initiative at the University of Milan (San Paolo campus)

This study analyses students' experiences in a medical humanities course that has been part of the medical curriculum at the San Paolo Campus of the University of Milan since 2010. According to Battezzati[8], who conceived and directs the medical humanities initiative at the Campus, the course aims to counterbalance the excessive emphasis on biological aspects in medical degree programs and the increasing technologization of medical knowledge in contemporary society. The course, entitled *Medical Humanities*, is designed to foster a reflective understanding of healthcare relationships. Structured into three instructional modules, it is delivered to all first-year medical students. As a compulsory component of the curriculum, the course engages approximately one hundred students enrolled on the campus each academic year[9].

The first module, *First Approach to the Patient* (FAP), introduces students to the fundamentals of patient care through a three-week shadowing experience within designated clinical divisions. This initial clinical clerkship is intended to provide students with early, structured exposure to real-world patient interactions. Through small-group discussions and plenary sessions, participants critically examine the experience of illness and the clinical dimensions of disease. During this three-week attendance period, each student is paired with a nurse in three different divisions of the teaching hospital, allowing for direct observation of care practices. At the beginning of each week, students take part in a preparatory small-group briefing session, followed by a debriefing led by the course instructor and the Chief Nurse who is also in charge of the nurses' training and the student-nurse pairing process for this module. These sessions are designed to cultivate attentive observation, reflective engagement with care relationships, awareness of the emotional impact of patient encounters, and an appreciation for the importance of self-reflection and emotional communication within healthcare teams.

Building upon the *First Approach to the Patient* module, the second module, *A Method for the Clinician*, deepens the exploration of the illness experience through interactive small-group activities and plenary sessions conducted in parallel with the ward-based component. This course unit examines the epistemological and ethical—procedural foundations of medical professionalism, situating them within the broader framework of human vulnerability, relationality, empathy, and care as articulated in the Western philosophical and cultural tradition. It provides students with a conceptual and practical grounding in rational patient care and diagnostic logic by addressing the cognitive, ethical, and professional dimensions of clinical practice. Core topics include the rational characterization and interpretation of symptoms, the collaborative development of treatment plans, the concepts of Empathy and Cure, the distinction between "care" and "cure" and the ethical assessment and communication of prognosis. At the end of the attendance period, each student has to comply with the mandatory task to upload on the learning platform of the Università degli Studi di Milano a written essay on their experience. Each text is graded according to the grid proposed by Moon *et al*. to evaluate reflective writing, and is discussed with each student during the final oral examination of the course.

The third module, *History of Medicine*, introduces students to the principal developments in the history of Western medicine, the evolution of medical professionalism, and the conceptual distinctions among disease, illness, and care. The course traces the trajectory of medicine from its origins to the contemporary era, beginning with an examination of the meanings of medicine and the sources employed in historical and medical research. It then explores medical practices in ancient Greece and Rome, the continuities and transformations of medieval traditions, and the Renaissance advancements in anatomy, iatrophysics, iatrochemistry, and microscopy that paved the way for discoveries concerning the cell and modern DNA technologies. The Enlightenment

period is presented as a pivotal moment in the emergence of public health, marked by developments in occupational medicine, hygiene, preventive care, vaccination, orthopedics, and the humanitarian reform of mental health care. The course subsequently addresses the birth of the modern clinic, emphasizing the advent of diagnostic and therapeutic instrumentation and the progress of surgical practice through analgesia, anesthesia, asepsis, and antisepsis. Finally, it examines twentieth-century innovations in medical concepts, technologies, and therapies, together with the evolving role of hospitals as central institutions of care.

As part of the ongoing effort to integrate the humanities into medical education at the San Paolo campus, the *Writing to Learn Reading* module complements the clinical medicine curriculum for second-year medical students. This training unit aims to broaden students' writing practice from a primarily descriptive to a reflective mode by engaging them in the collection and composition of an illness narrative based on an individual encounter with an inpatient. Following small-group debriefings and instructional sessions dedicated to reflective writing, students are asked to produce a narrative text about their clinical encounter and to share it within small-group discussions and plenary sessions.

Methods

To examine students' perceptions of the *Medical Humanities* program offered at the San Paolo campus, in-depth interviews were conducted with twelve participants who had previously completed the course and voluntarily consented to take part in the study. A convenience sampling strategy was employed, without specific inclusion or exclusion criteria related to demographic variables[10]. Using Battezzati's student mailing list, an invitation email was sent to students who had attended the classes over the past ten years and were still traceable. Twelve persons - eight females and four males aged between 22 and 29 years (see Table 1) - volunteered to participate in the study and, after providing informed consent in accordance with the General Data Protection Regulation (GDPR), were interviewed in Italian via the Microsoft Teams platform to facilitate participation. Two of the participants were medical students and ten medical residents. The objective of the interviews was to investigate not only participants' experiences with the *Medical Humanities* course but also the potential impact of the program on their medical education and professional practice.

Each interview began with the interviewer introducing herself, explaining the purpose of the study, confirming participants' understanding of the consent form, and addressing any preliminary questions. The semi-structured interviews, conducted in Italian, lasted between 45 and 60 minutes and consisted of five open-ended questions designed to elicit participants' reflections on their experiences with the *Medical Humanities* program. The interview guide included the following prompts:

Tab. 1. Participant Characteristics

Participant ID	Age	Sex	Academic Year of Attendance	Current Profession
P1	25	Female	2019/2020	Medical graduate working as an on-call physician (pre-residency)
P2	25	Female	2018/2019	Resident in Pediatrics, second year
P3	32	Female	2013/2014	Resident in Internal Medicine, fourth year
P4	27	Female	2017/2018	Resident in Obstetrics and Gynecology, third year
P5	29	Male	2016/2017	Resident in Emergency Medicine, third year
P6	22	Male	2022/2023	Medical student, third year
P7	22	Male	2023/2024	Medical student, second year
P8	28	Female	2016/2017	Resident in Sports Medicine, third year
P9	26	Female	2017/2018	PhD candidate in Neuroscience, second year
P10	29	Female	2016/2017	Resident in Obstetrics and Gynecology, second year
P11	28	Male	2016/2017	Resident in Endocrinology, first year
P12	26	Female	2020/2021	Medical graduate working as an on-call physician (pre-residency)

1. How would you describe your experience in the *Medical Humanities* course? If possible, summarize it in a single word or phrase.
2. Do you believe that attending these courses has influenced your development as a medical professional?
3. Which aspects of the course did you find most effective, and which least effective?
4. Do you recall any particular experience or moment that left a strong impression on you?
5. Do you think it is appropriate to include this type of course in the educational curriculum for young doctors? Why or why not?

The Microsoft Teams platform automatically generated verbatim transcripts of the interviews, which were subsequently translated into English (with the assistance of ChatGPT) and reviewed by the authors for accuracy. All transcripts were then analysed by the authors to identify recurring themes, perspectives, and insights within participants' responses, using an inductive approach based on open coding. The main themes that emerged from the analysis are presented in relation to each interview question.

Results

The *Medical Humanities* course was generally well received and described as a positive and meaningful experience (see Table 2). Participants characterized it as "positive," "strongly impactful," "human," and "instructive," primarily because it provided the opportunity to engage in supervised bedside practice during the first year of medi-

Tab. 2. Participants' description of Medical Humanities course

Description in one word	Participants' comments
Positive	"It certainly remains, overall, a **positive** experience, as it throws you straight into bedside practice. Compared to many other campuses where this is not offered, it is definitely helpful in understanding whether that environment might suit you." (Participant 12) "Certainly **positive**, because right from the very beginning, you encounter the reality of the situation." (Participant 10) "The fact that it was taken as the first course may have made the impact even greater, which I consider to be **positive**." (Participant 11)
Human	"It somewhat forces you to look within yourself and, let's say, to analyze your human side as well as the **human** dimension of interacting with patients." (Participant 1)
Innovative	"Absolutely positive, and also **innovative —** perhaps because it is something that, even today, I think is still not very widespread. At the time when I took it, it certainly wasn't." (Participant 5)
Complementary to clinical and instructive	"**Complementary** to the more clinical and pre-clinical components, and absolutely necessary for the medical curriculum." (Participant 3) "It was **instructive**, I would say, almost on an emotional level, especially when I had conversations with healthcare professionals or when speaking with patients." (Participant 7)
Life-changing	"If I had to describe them in one word, I would say **life-changing**, because it's a course that really places you directly in front of a person, above all." (Participant 6)
Impactful	"I would probably say **impactful**, because it was my first real approach to medicine, and a good one, since medical courses usually start with the study of basic sciences, which are very far from what the actual work of a doctor is." (Participant 2)
Challenging and engaging	"**Challenging** in the practical part, but an **engaging** experience to the point that you hardly notice it." (Participant 9)
Overlooked	"Not among the aspects most retained from medical school, because it was structured around a more humanistic approach, whereas what you gain most concretely after the years of medical school is mainly knowledge and clinical skills." (Participant 4)

cal school. Only one participant expressed a more reserved view, stating that "it is not what I gained the most from my years of medical school," explaining that "it was structured around a more humanistic approach, whereas what you gain most concretely after the years of medical school is mainly knowledge and clinical skills" (Participant 4). With the exception of this and one other participant, all interviewees acknowledged an impact of the course on their medical education (see Table 3). The influence was primarily associated with the development of an understanding of the human dimension of care and the acquisition of skills for interacting and communicating effectively with patients, fostering both empathy and emotional regulation. Additional areas of impact included learning how a hospital functions, collaborating with nurses, and rec-

Tab. 3. The Role and Impact of Medical Humanities in Medical Education and Practice

Theme	**Description**	**Representative participants' comments**
Human Dimension of Medical Practice Sub-theme: Human approach to the patient	Most respondents identified the primary impact as gaining an understanding and experience of the human dimension of the medical profession, emphasizing the importance of viewing the patient as a person rather than merely as a case or pathology.	"Understanding that the person is not the disease, but the disease is a corollary of the person, is something I carry with me from this teaching and try to keep in mind in my work." (Participant 11) "In my current practice, I do not use a standardized approach; I focus on the individual person in front of me and their story. This is something I learned there." (Participant 2)
Sub-theme: Communication with the patient	Participants highlighted that the course concretely helped them develop communication skills with patients, as it provided an opportunity to focus exclusively on patient interactions. It also underscored the importance of non-verbal communication in clinical encounters.	"The course helped me realize that communication is not always as described in manuals." (Participant 9) "It made me pay attention to details I hadn't noticed before. For example, observing facial expressions to understand concerns, doubts, or questions that a person might unconsciously express through their face." (Participant 6)
Sub-theme: Empathy/emotional regulation	Learning — both theoretical and practical — about how to establish an empathetic relationship with patients emerged in nearly all interviews. The course helped participants not only to put themselves in patients' shoes and better understand their experiences, but also to maintain an appropriate professional distance.	"We had been given interpretative keys on how to establish an empathetic relationship with the patient, and I believe I partly carry this with me in the way I approach patients." (Participant 5) "It taught us the difference between empathy and compassion. Compassion involves pitying, thus suffering alongside the other person, whereas empathy is about understanding the other's feelings without becoming too personally involved." (Participant 1)
Sub-theme: Vulnerability	Two participants raised the theme of accepting vulnerability, not only that of patients, but also, and perhaps above all, that of healthcare professionals.	"Understanding one's own limits — that is, realizing that one is not a robot, does not know everything, and should not pretend to know everything. Rather than saying something incorrect, it is better to acknowledge one's limits. This is a lesson that the course has left me with." (Participant 6)

Theme	Description	Representative participants' comments
Understanding Hospital Functioning	Three participants stated that the course helped them understand how a hospital functions, providing an opportunity to observe the operation of different departments and to work alongside nurses.	"In my opinion, it greatly helps to gain a 360° view of the physician's role and of those who work around the physician." (Participant 5) "It was really an immersion in reality, showing not only the environment experienced by patients, but also that of the staff, particularly regarding the tensions that can arise." (Participant 10)
Learning of Medical Skills	Three participants reported that the course taught them basic medical skills, such as measuring blood pressure, but above all, understanding the rationale behind symptoms and prescribed therapies.	"From a knowledge perspective, it is very enriching because it allows you to gain experience empirically. In my opinion, it helps much more than study to understand, for example, that a particular therapy was given to a patient for specific reasons... and these reasons were explained to us." (Participant 6) "I realized that a symptom can sometimes simply be the manifestation of an issue whose root lies elsewhere — something that does not really emerge when studying the more theoretical subjects." (Participant 7)
Foundation of a Background	All participants agreed that the *Medical Humanities* course provided an important foundational background. Two participants stated that they did not clearly perceive an impact in terms of specific skills, instead attributing to the course a role of initiation and of building a conceptual foundation.	"It provides a perspective you are at the very beginning of your path, at the start of their career, having faced almost nothing yet, and it gives you a viewpoint on how to approach what will come afterward." (Participant 5) "Maybe little of it really stays with you, because as I said, what you mostly carry with you are the things you learned from clinical practice. But probably, how can I say as a kind of background, as an underlying layer, it remains." (Participant 4)

ognizing the importance of healthcare professionals' mental health. Some participants also reported gaining basic clinical competencies, such as understanding the rationale behind therapeutic decisions or measuring blood pressure. One participant emphasized the importance of accepting one's own vulnerability and limitations, including the inherent boundaries of scientific knowledge, whereas two participants were un-

able to identify a specific impact, referring instead to a "foundation or background influence" (Participant 4).

Regarding the most and least effective aspects of the course structure (see Table 4), the module unanimously recognized as the most effective was *First Approach to the Patient*, due to its ability to translate theoretical learning into practical experience efficiently and effectively. The *A Method for the Clinician* module was also appreciated by nearly half of the participants for integrating key theoretical components, such as "the logic of the early foundations of clinical practice, reasoning, the patient's perspective, and sensitivity" (Participant 6). A quarter of the respondents identified the briefing and debriefing sessions as particularly effective components of the course. The briefings were valued for helping students "not be thrown into the jungle of the ward" (Participant 6), while the debriefings supported the processing and reflection on ward experiences. In the same vein, the written assignment encouraging students to elaborate on their experiences was valued by two participants. Another quarter of the respondents appreciated the group work activities, which allowed them to explore diverse perspectives on shared issues. Similarly, a quarter of participants valued the *History of Medicine* module, describing it as interesting and "a necessary cultural background" (Participant 7). One participant highlighted the opportunity to work alongside nurses—rather than doctors, as typically occurs during clerkships—as an effective aspect, while another emphasized taking the patient's history as particularly valuable.

Regarding the less effective aspects of the course, almost half of the participants felt that the theoretical module *A Method for the Clinician* was too long, occasionally repetitive, and overly "philosophical," particularly in the section concerning empathy, which risked becoming utopian and of limited practical relevance. In their view, the module could be shortened to allow more time for practical activities, both in class and in the wards. Similarly, with regard to the *History of Medicine* module, half of the participants, although describing it as interesting, were unable to identify a direct connection to their medical practice. Two participants reported difficulties related to the very early schedule and the overlap with concurrent courses, which made attendance burdensome and reduced its appeal for part of the class. One participant also noted that, despite the professor's participatory teaching style, the large number of attendees in each session hindered active engagement and dialogue.

With regard to the recollection of impactful experiences, more than half of the respondents referred to the influence of their initial exposure to the ward environment and to the patients they encountered, particularly their stories and interactions with them. Two participants recalled a reflective exercise involving paintings presented during the theoretical classes, while others mentioned experiences such as recognizing personal discomfort or incompatibility with certain wards or pathologies, listening to stories shared by peers, and reflecting on the *History of Medicine* module.

Tab. 4. Medical Humanities Modules

Module	Students' Perceptions	Representative participants' comments
First Approach to the Patient	This module was unanimously recognized as the most effective, as it offered a powerful first experience within the hospital ward. Students appreciated the opportunity to focus exclusively on patient interactions and to gain insight into ward operations, particularly through close collaboration with nurses. Patient encounters were described as especially impactful. For more than half of the participants, the guided briefing and debriefing sessions held throughout the week were considered fundamental, distinguishing this bedside experience from others, along with the reflective diary assignment. The only reported drawback concerned the early start of daily activities, which made the days and subsequent lectures particularly demanding.	"Because in the First Approach to the Patient module in Medical Humanities, the patient is seen as a person. During internships — and it's unpleasant to say, but it's true — the patient is often seen just as someone with symptoms to solve. Instead, Medical Humanities helps you take a step back and consider all the other aspects surrounding those signs and symptoms. So, in my opinion, taking a Medical Humanities course is essential". (Participant 6) "It was really a dive into reality, showing not only what the environment is like for the patients, but also for the healthcare staff themselves." (Participant 10) "It's the one that struck me the most emotionally, compared to theory or classroom discussions with professors. Experiencing a hospital environment and a patient's suffering already in the first year, and then being able to reflect on my own emotions and feelings and put them into writing, is what stayed with me the most." (Participant 8)
A Method for the Clinician	The theoretical module was generally appreciated, though with less unanimity than *First Approach to the Patient*. The lectures on foundational topics were positively received overall, although at times perceived as repetitive, overly "philosophical," or insufficiently connected to the practical aspects of the medical profession. Sessions on empathy elicited mixed reactions: some students found them useful, while others considered them less effective. Group work and poster activities were valued by certain participants as opportunities for discussion and exchange of perspectives, whereas others regarded them as less effective, occasionally perceiving them as trivializing the content. Overall, students acknowledged the importance of a theoretical module, but most felt it could be streamlined and more explicitly linked to clinical practice.	"The content itself, as it was designed, was the best part. The issue was more about how it was managed in terms of timing — in the end, it gave the impression that the course was less important than it actually could have been, because there were too many repetitions. In my opinion, using a methodology like making posters together didn't really fit for students who were entering university and wanted to be treated as adults — it wasn't taken very seriously." (Participant 9) "It was as if sometimes he gave examples — even clinical cases or people — that were very, very far from what actually happens in practice, with much greater attention to the patient than what really occurs. And perhaps this is precisely what makes them so distant from real clinical practice that they end up being of little use." (Participant 2) "I would say that a minimal theoretical component, together with interaction with a strong personality — such as our Professor, who clearly explained the concepts of Medical Humanities — is, in my opinion, appropriate and essential." (Participant 8) "Some of the lessons taught by our Professor are aspects that I still remember clearly. The idea of looking at the patient beyond the clinical gaze, with an empathetic eye, and truly understanding the meaning of empathy — caring for the patient, seeing them beyond their illness, recognizing that they are a person first — is definitely something that has stayed with me." (Participant 11)

Module	Students' Perceptions	Representative participants' comments
History of Medicine	The *History of Medicine* module was generally regarded as interesting by most students. It was appreciated both as a valuable cultural background and as meaningful knowledge at personal and professional levels; many emphasized the importance of a physician's awareness of the history of their profession. However, half of the students struggled to recognize its concrete usefulness and, in some cases, to fully appreciate it. It was described as particularly impactful by about one-third of participants, while others did not mention it spontaneously during the interview. One student suggested that offering the module later in the curriculum—when students have greater maturity—might enhance its appreciation, reflecting their own experience of initially overlooking it in the first year but coming to value it at a later stage.	"I liked that part — I found it interesting, though I didn't quite understand how it related to Medical Humanities, since it felt a bit like a different topic. It was very interesting to see how things have progressed over time — it can even serve as an incentive for technical advancement. But overall, I saw it as something nice, pleasant, and curious — a bit of history, and I like history — but not something with major relevance or usefulness for my future." (Participant 4) "I think it's very useful. Unfortunately, it's one of those things you often tend to underestimate, because compared to other subjects, like anatomy, it seems less important. But in my opinion, it is important. For me, it's definitely something worth doing. I can't say I took it completely seriously — probably like many others in the course — perhaps because it might make more sense to do it later, maybe in the second semester or when you have a bit more awareness. But in any case, it should be done." (Participant 12)

Regarding whether participants considered it meaningful to include this type of course in medical training, all respondents affirmed that it was (see Table 5). The nearly unanimous motivation concerned the need for an early humanistic introduction to the profession, with particular appreciation for the emphasis on patient interaction and empathy, which were regarded as fundamental competencies for physicians. Several participants observed that the *Medical Humanities* course addresses a gap in extra-clinical, particularly humanistic, skills that are essential for medical practice, noting that "there is so much more within medical and human interaction that requires a language to be structured" (Participant 9). A few participants further emphasized that the course helps first-year students assess whether the hospital environment and patient-centered work are suited to them.

Tab. 5. Participants' reasons for supporting the inclusion of Medical Humanities courses in medical curricula

Theme	Description	Representative participants' comments
Establishing a Foundation	Most interviewees believed that this type of course provides students with a solid foundation for their educational and professional development, particularly regarding their approach to patients. All participants agreed on the appropriateness of placing it at the beginning of the medical curriculum, while some suggested that it should be offered again at a later stage in the program.	"It should be included because the whole point of the course is to prevent us from becoming machines that just fire off diagnoses — which is very easy to do. In fact, I wish there were something like this accompanying us throughout all the years of medical school, not just at the beginning. At the start, we are more of a blank slate that can be shaped differently. Later, I really felt the lack of a structure — even a linguistic one — for interpreting human experiences and the events that occur." (Participant 9) "The Medical Humanities course is also preparatory for internships and any kind of clinical training because it truly shapes how you interact with patients — fostering a real attention to empathy and understanding toward others. This focus on empathy is something that is not emphasized later in clinical courses." (Participant 6)
Developing Empathy	Many interviewees identified the course's emphasis on cultivating an empathetic approach toward patients as the main reason for its inclusion in the medical curriculum. One participant noted that empathy is what will distinguish human physicians from artificial intelligence, while another suggested that the course could include a deeper exploration of communication techniques.	"What we really need to focus on is the empathy in communication. I am convinced of this: people could find out they have diabetes through ChatGPT. But how is that information communicated? Even the impact of physical contact with the physician influences patient compliance. In my view, these courses should actually be strengthened." (Participant 11) "As physicians, we need training in interpersonal relationships and communication because we work closely with people. I truly believe we need this more human side and greater focus on communication." (Participant 4)
Addressing the Gap in Non-Clinical Skills	Several respondents mentioned during the interviews the lack of non-clinical skills in medical training. They indicated that the rationale for including such a course is to address this gap in the education of a profession that is not only technical, but also profoundly human-centered.	"In our training program, very little time is dedicated to non-clinical skills, so this alone, in my view, is a strong reason to include such a course. Simply having the opportunity to devote time and space to something beyond pure medical practice, addressing also broader, transversal topics, is always welcome. Additionally, it helps in developing a personal approach to patient care, beyond just technical skills." (Participant 5) "There is so much more within medical and human interaction that requires a language to be properly structured. In my view, this aspect is still lacking within medical curriculum." (Participant 9)

Theme	Description	Representative participants' comments
Understanding the Medical Profession	Some participants believed that including this type of course is meaningful because it helps students — through ward experience and subsequent reflection — understand what it truly means to be a physician and whether this profession is suited to them.	"The main reason is that, more than learning empathy — which, I repeat, you mature over time, not even during internships but in the profession — this course is useful for immersing you in the ward. It's not about figuring out what you want to do, because that comes with time; rather, it helps you understand whether you enjoy the hospital environment, whether you feel comfortable interacting with patients of any kind, and how that experience makes you feel." (Participant 12) "Because studies have shown that medical schools offering courses of this type in the early stages have lower dropout rates, as students become more aware of what they will face." (Participant 7)
The Importance of a Charismatic Instructor	In discussing the rationale for including this type of course, several respondents reflected on the impact of a charismatic instructor. All participants described the instructor as a positive and engaging presence, particularly during feedback circles. A few wondered whether the course would remain as meaningful with a less charismatic or less passionate teacher. While acknowledging that the instructor's personality made a difference, they agreed that the course would still be valuable in itself.	"In my view, the instructor matters a lot, they need to be someone who truly believes in what they are teaching. However, I also think that even if someone less charismatic were to teach it, the course could still be somewhat useful, because it would still provide some valuable insights." (Participant 2) "I feel very fortunate to have had, at the beginning of the program, an instructor — this I must say, like our Professor —because such humanity in a medical university professor is by no means a given." (Participant 11)

Discussion

This study explored the perceptions of students and medical residents regarding the *Medical Humanities* course. Most participants identified the course's main impact as fostering an understanding and experience of the human dimension of the medical profession, with particular emphasis on empathy, communication, and the importance of viewing "the patient as a person" (Participant 6). These findings are consistent with existing literature on the contribution of medical humanities to medical curricula, which highlights their role in promoting empathy[11], reflection, and awareness of what it means to practice medicine[12].

Similarly, the results confirm the value of introducing such a course at the beginning of medical training, when students are still relatively unformed in their professional identity and thus more receptive to reflective and relational learning[13], being "a more

of a blank slate that can be shaped" (Participant 9). As several participants noted, the *Medical Humanities* course provided a foundational approach to patient care early in their education, being "preparatory for internships and any kind of clinical training" (Participant 6). However, some lamented the lack of continuity of such instruction throughout the curriculum, observing that, as clinical and technical subjects take precedence, the humanistic dimension tends to fade, a pattern also documented in other studies[14]; one person stated that "in our training program, very little time is dedicated to non-clinical skills" (Participant 5) while another thinks that "there is so much more within medical and human interaction that requires a language to be properly structured. In my view, this aspect is still lacking within medical curriculum" (Participant 9). This finding suggests that the initial impact of humanities-based teaching may diminish over time but simultaneously underscores students' recognition of its importance, a result that aligns with other research[15]. The only participant who did not express enthusiasm for the course stated that "maybe little of it really stays with you, because, as I said, what you mostly carry with you are the things you learned from clinical practice" (Participant 4).

Distinct from comparable programs, the San Paolo course combines theoretical instruction in the humanities with a ward-based module, which emerged as the most valued component (See Table 4). This appreciation is understandable given that the course occurs during the first semester of medical school, offering students their earliest exposure to the hospital environment. While this timing contributes to its strong impact, it also risks conflating the value of the *First Approach to the Patient* module with the excitement of first hospital contact. To explore this issue further, students were asked whether and how the module differed from subsequent bedside experiences. Most described it as unique in allowing them to focus exclusively on patient and team interactions and on processing their experiences, without the pressure to demonstrate clinical knowledge. One participant said that "the module had a somewhat clinical feel, but in my view the aim was not to focus on the strictly clinical or medical aspects, but rather on the relationship with the patient. And, in my opinion, it was certainly valuable to be able to focus only on this" (Participant 5). Another person declared that "during internships — and it's unpleasant to say, but it's true — the patient is often seen just as someone with symptoms to solve. Instead, Medical Humanities helps you take a step back and consider all the other aspects surrounding those signs and symptoms. So, in my opinion, taking a Medical Humanities course is essential" (Participant 6).

Consistent with other studies[16], the briefing and debriefing sessions were regarded as particularly effective and valuable, providing a structured space for reflection and discussion, an element often absent from other parts of the curriculum. Similarly, the inclusion of reflective writing was highly appreciated, as this type of activity is rarely integrated elsewhere in medical training[17]. Collectively, these opportunities for guided

reflection on bedside experiences appear to be among the course's most significant contributions to both medical education and professional formation; "by talking about one's experiences, one becomes aware of aspects that, when merely living through them, are not sufficiently recognized" (Participant 6).

Nonetheless, the strong emotional and experiential impact of the ward component may have inadvertently reduced students' appreciation of the theoretical modules, which were perceived as less distinctive or immediately relevant. The value of these components tended to be recognized only partially or retrospectively; "it was a course that was always not taken super seriously, especially these lectures, which felt somewhat informal - mostly talking. These are absolutely important topics, but at that moment I didn't realize it" (Participant 12). Yet, as students themselves acknowledged, particularly those who appreciated the feedback sessions and reflective writing assignments, the program's strength lies in the integration of practical experience with theoretical, historical, and philosophical perspectives, all of which are essential to a comprehensive understanding of medical practice, as a participant describing; "it was really a course that brought together elements of logic, the first foundations of clinical practice, reasoning, the patient's perspective, and sensitivity" (Participant 6). Some participants also suggested strengthening the connection between theoretical content and clinical application, for instance by incorporating practical communication techniques, case-based discussions, and elements of clinical psychology. A participant suggested: "I would try to integrate this Medical Humanities pathway—including attendance and ward-based experience—from the very first years with a communication pathway. We need a relational and communication component because we work in close contact with people. I truly believe we need this more human side, more communication, and opportunities for reflection on certain themes, situations, and scenarios that we may encounter" (Participant 4).

Another theme concerns the influence of the instructor's personality, which has also been identified as a crucial factor in the literature[18]. In this case, the instructor was widely appreciated and described as charismatic and passionate, as it follows "I feel very fortunate to have had, at the beginning of the program, an instructor - this I must say, like our Professor - because such humanity in a medical university professor is by no means a given" (Participant 11). Several participants questioned whether and to what extent the course's effectiveness depends on the instructor's personal qualities. Overall, feedback indicated that while the instructor's enthusiasm enhanced engagement, the perceived relevance and significance of the course extended beyond individual charisma; "in my view, the instructor matters a lot, they need to be someone who truly believes in what they are teaching. However, I also think that even if someone less charismatic were to teach it, the course could still be somewhat useful, because it would still provide some valuable insights" (Participant 2).

In conclusion, although this study focuses on a specific and relatively small context, it reinforces findings from other research regarding the needs and aspirations of medical students, particularly their desire to develop extra-clinical competencies and to receive support in cultivating the human dimension of medical practice. The results highlight the pedagogical value of integrating reflective, relational, and humanistic education early in medical training and sustaining it throughout the curriculum.

Conclusions and Implications

Findings from this study suggest that early exposure to medical humanities can play a key role in shaping students' understanding of the human dimension of medicine, fostering empathy, reflection, and awareness of the relational aspects of care. Among the three modules —bedside experience, theoretical lectures, and History of Medicine— the bedside component was the most highly valued, as it offered a meta-reflective opportunity to examine the physician–patient relationship. Although some limitations were noted, particularly the perceived distance of certain theoretical modules from clinical practice, the overall perception was that the course provides a meaningful introduction to the human aspects of the medical profession.

The study involved twelve participants, including medical students, recent graduates, and residents from various specialties such as Pediatrics, Internal Medicine, Emergency Medicine, Obstetrics and Gynecology, Endocrinology, and Sports Medicine, as well as one PhD candidate in Neuroscience. Participants represented different academic years of attendance (from 2013–2014 to 2023–2024) and stages of professional development, ranging from second-year students to practicing residents and pre-residency on-call physicians. This diversity contributed to a multifaceted understanding of the course's short- and long-term impact, as participants were able to reflect on their experiences both as learners and as professionals applying those insights in clinical contexts.

Through the combination of theoretical and experiential learning, the course appears to foster a holistic professional identity and provide a foundational background for both medical training and practice. The results clearly indicate that experiential learning and hands-on approaches are perceived as the most effective and engaging methodologies, standing out as more impactful and meaningful to students than purely theoretical instruction. However, the findings also highlight the need for greater continuity of such approaches throughout the medical curriculum. Students reported that, while impactful, the benefits of the course tend to fade as clinical and technical learning intensifies. This underscores the importance of developing longitudinal and integrated models of humanities education that accompany students beyond the first year.

At the same time, the study's design presents several limitations that should be acknowledged. The sample was small and context-specific, comprising twelve partici-

pants with diverse backgrounds, which inevitably limits the generalizability of the findings. Although the inclusion of individuals from different academic years and professional stages, ranging from early-year students to residents and medical graduates, offered a broad temporal and experiential perspective, it may also have introduced variability in recall and perception. The voluntary nature of participation may have further contributed to a self-selection bias, as students with a stronger interest in or more positive attitude toward the humanities may have been more inclined to participate. Nevertheless, this risk is partly mitigated by the inclusion of two participants who expressed more critical views of the course, as well as by the consistent positive feedback recorded in end-of-course evaluations in recent years.

Overall, while the small sample size and potential selection bias constrain the transferability of the results, they do not undermine the study's exploratory objective, which was to capture the subjective experiences and perceived impact of the *Medical Humanities* course on those who attended it. The findings provide valuable insights into the formative potential of humanities-based education within medical training and highlight the importance of ensuring its continuity and integration across the curriculum.

This case study reflects a single institutional context and does not include comparative analysis with other medical humanities programs in Italian universities, which are numerous but often lack a coherent or systematic structure. Future research could qualitatively examine the design, implementation, and outcomes of such programs across Italy, with the aim of fostering best-practice exchange and strengthening inter-university collaboration to support the integration of humanistic education within medical curricula.

The etymological roots of *medicina* and *medicus* remind us that medicine, at its core, arises from the act of caring and attending to another. This intrinsic idea of care, embedded in the very language of the medical profession, continues to resonate in contemporary medical education through the growing field of medical humanities. The findings from this study demonstrate that early exposure to the humanities can reawaken this original meaning by fostering empathy, reflection, and relational awareness among medical students. The San Paolo Campus experience illustrates how a curriculum grounded in both science and *techne*, in the art and practice of care, can contribute to the formation of more reflective and compassionate professionals. Reconnecting the scientific and the humanistic thus reaffirms the classical conception of medicine not merely as a technical discipline, but as a profoundly human practice rooted in attentiveness and solicitude for others.

Acknowledgements
The authors acknowledge the following contributions:
Chantal Marazia, Assistant professor of History of Medicine at the Università degli Studi di Milano.
Fiorella Robbiati, Chief Nurse, who was in charge of the nurses' training for the bedside experience and of the student-nurse pairing process, and co-chaired the briefing and debriefing encounters during the students' attendance weeks.

Bibliography, references and notes
Altschuler S, Metzl JM (eds), Keywords for health humanities. New York (NY): New York University Press; 2023.
Banner O, Carlin N (eds), Teaching health humanities. 1st ed. Oxford: Oxford University Press; 2019.
Belling C, Friedman LD (eds), Health humanities reader. 1st ed. New Brunswick (NJ): Rutgers University Press; 2014.
Benabed F, Applied global health humanities: readings in the global Anglophone novel. 1st ed. Vol. 4. Berlin (Germany): De Gruyter; 2024.
Bleakley A, Medical humanities: ethics, aesthetics, politics. 1st ed. London: Routledge; 2023.
Bleakley A (ed.), Routledge handbook of the medical humanities. London: Routledge; 2020.
Cole TR, Carlin NS, Carson RA, Medical humanities: an introduction. New York: Cambridge University Press; 2015.
Crawford P, Brown B, Charise A (eds), The Routledge companion to health humanities. Abingdon (UK): Routledge; 2020.
Curi U, Le parole della cura. Milano: Raffaello Cortina Editore; 2017.
Howley L, Gaufberg E, King B, The fundamental role of the arts and humanities in medical education. Washington (DC): AAMC; 2020.
Jones T, Pachucki K, The medical/health humanities: politics, programs, and pedagogies. Cham (CH): Springer International Publishing; 2022.
Assing Hvidt E, Ulsø A, Thorngreen CV, Søndergaard J, Andersen CM. Weak inclusion of the medical humanities in medical education: a qualitative study among Danish medical students. BMC Med Educ. 2022;22(1):660:e1–e11.
Axelrod C, Brenna CT, Gershon A, Peterkin A, Nyhof-Young J, The Companion Curriculum: medical students' perceptions of the integration of humanities within medical education. Can Med Educ J. 2023;14(2):119-124. doi:10.36834/cmej.72907.
Cole TR, Carlin N, The art of medicine: the suffering of physicians. Lancet. 2009;374(9699):1414.
Eikeland HL, Ørnes K, Finset A, Pedersen R, The physician's role and empathy: a qualitative study of third-year medical students. BMC Med Educ. 2014;14(1):e1-e8.
Eno C, Piemonte N, Michalec B, et al. Forming physicians: evaluating the opportunities and benefits of structured integration of humanities and ethics into medical education. J Med Humanit. 2023;44(4):503-531.
Fieschi L, Matarese M, Vellone E, Alvaro R, De Marinis MG, Medical humanities in healthcare education in Italy: a literature review. Ann Ist Super Sanita. 2013;49(1):56-64.
Halpern J, From detached concern to empathy. Humanizing medical practice.Oxford: Oxford University Press; 2001.
Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, Veloski J, Gonnella JS, The devil is in the third year: a longitudinal study of the erosion of empathy in medical school. Acad Med. 2009;84(9):1182-1191.

Jain V, Zamanian K, Krishnan L, The new clinician-scholars: dual training in medicine and humanities drives health research innovation. JAMA. 2025. doi:10.1001/jama.2025.15526. Epub ahead of print.
Lombardi L, Murero M, Guzzo P, Moretti V, Porrovecchio A, Scavarda A, Lombi L, L'insegnamento delle Medical Humanities: risultati di uno studio sui corsi di laurea in medicina e chirurgia in Italia. J Ital Med Educ. 2023;88:3922-3927.
McLean D, Chiavaroli N, Denniston C, Richardson M, In-verse reflection: structured creative writing exercises to promote reflective learning in medical students. J Med Humanit 2022;43(3):498-511.
Moniz T, Golafshani M, Gaspar CM, Adams NE, Haidet P, Sukhera J, Volpe RL, de Boer C, Lingard L, How are the arts and humanities used in medical education? Results of a scoping review. Acad Med. 2021;96(8):1213-1222.
Moniz T, Golafshani M, Gaspar CM, Adams NE, Haidet P, Sukhera J, Volpe RL, de Boer C, Lingard L, The Prism Model for integrating the arts and humanities into medical education. Acad Med. 202;96(8):1225.
Moon JA, A handbook for reflective practice and professional development. London - New York: Routledge; 2010.
Neumann M, Edelhäuser F, Tauschel D, Fischer MR, Wirtz M, Woopen C, Haramati A, Scheffer C, Empathy decline and its reasons: a systematic review of studies with medical students and residents. Acad Med. 2011;86(8):996-1009.
Nocentini A, L'etimologico. Vocabolario della lingua italiana. Firenze: Le Monnier, 2010.
Orefice C, Pérez G, Baños JE, The presence of humanities in the curricula of medical students in Italy and Spain. Educ Med. 2019;20:79-86.
Patuzzo S, Ciliberti R, Medical humanities: recognition and reorganization within the Italian university. Acta Biomed. 2018;88(4):512-513.
Petrou L, Mittelman E, Osibona O, Panahi M, Harvey JM, Patrick YAA, Leedham-Green KE, The role of humanities in the medical curriculum: medical students' perspectives. BMC Med Educ. 2021;21(1):e35-e42.
Shankar PR, Piryani RM, Changes in empathy among first-year medical students before and after a medical humanities module. Educ Med J. 2013;5(1):e1-e5.
Wear D, Zarconi J, Kumagai A, Cole-Kelly K, Slow medical education. Acad Med. 2015;90(3):289-293.
Lamb EG, Berry SL, Jones T, Baccalaureate programs in health humanities [Internet]. HHC Curricular Toolkit. [place unknown]: Health Humanities Consortium; 2022 [cited 2025 Oct 18]. Available from: https://healthhumanitiesconsortium.com/publications/hhc-toolkit/.
Medical Humanities & Medicina Narrativa – MHMN [Internet]. Genzano di Roma (IT): Aracne Editrice; 2020 [cited 2025 Oct 18]. Available from: https://www.ojsaracne.eu/OJS/MHMN.

1. Curi U, Le parole della cura. Milano: Raffaello Cortina Editore; 2017. pp. 28-31.
2. In ancient Greek we find μήδομαι (mēdomai), "to be minded," "to consider."
3. Curi U, Ref 1. pp. 28-40.
4. Adapted from the Health Humanities Consortium's definition for Health Humanities [Internet]. [place unknown]: Health Humanities Consortium; [cited 2025 Oct 18]. Available from: https://healthhumanitiesconsortium.com/about/. For a history of the origins of the medical/health humanities, see: Bleakley A. Introduction: What are the medical humanities? In: Medical humanities: ethics, aesthetics, politics. 1st ed. London: Routledge; 2023. pp. 1-18.

5. Bleakley A (ed.), Routledge handbook of the medical humanities. London: Routledge; 2020. p. 28.
6. Many medical humanities programs and initiatives exist worldwide. For examples, see Lamb EG, Berry SL, Jones T, Baccalaureate programs in health humanities [Internet]. HHC Curricular Toolkit. [place unknown]: Health Humanities Consortium; 2022 [cited 2025 Oct 18]. Available from: https://healthhumanitiesconsortium.com/publications/hhc-toolkit/. Association of American Medical Colleges. The fundamental role of arts and humanities in medical education [Internet]. Washington (DC): AAMC; [cited 2025 Oct 18]. Available from: https://www.aamc.org/about-us/mission-areas/medical-education/frahme. Jones T, Pachucki K, The medical/health humanities: politics, programs, and pedagogies. Cham (CH): Springer International Publishing; 2022.
7. To learn about medical humanities initiatives in Italy, see Medical Humanities & Medicina Narrativa – MHMN [Internet]. Genzano di Roma (IT): Aracne Editrice; 2020 - [cited 2025 Oct 18]. Available from: https://www.ojsaracne.eu/OJS/MHMN.
8. Pier Maria Battezzati is Full Professor in the Department of Health Sciences, San Paolo Campus, University of Milan (UM). During this study, the authors corresponded with Prof. Battezzati to gather all the relevant information about the Medical Humanities course he has been organizing at San Paolo Campus.
9. Although the syllabus is also provided in English, the course is offered only in Italian; cf: Medical humanities [Internet]. University of Milan; 2025 [cited 2025 Oct 18]. Available from: https://www.unimi.it/en/education/degree-programme-courses/2025/medical-humanities.
10. For other examples of similar studies in Europe, see: Assing Hvidt E, Ulsø A, Thorn-green CV, Søndergaard J, Andersen CM, Weak inclusion of the medical humanities in medical education: a qualitative study among Danish medical students. BMC Med Educ. 2022;22(1):660.
11. Eikeland HL, Ørnes K, Finset A, Pedersen R, The physician's role and empathy: a qualitative study of third-year medical students. BMC Med Educ. 2014;14(1):165. Shankar PR, Piryani RM, Changes in empathy among first-year medical students before and after a medical humanities module. Educ Med J. 2013;5(1):e1-e5.
12. Eno C, Piemonte N, Michalec B, et al. Forming physicians: evaluating the opportunities and benefits of structured integration of humanities and ethics into medical education. J Med Humanit. 2023;44(4):507-523.
13. Ibid.
14. Neumann M, Edelhäuser F, Tauschel D, Fischer MR, Wirtz M, Woopen C, Haramati A, Scheffer C, Empathy decline and its reasons: a systematic review of studies with medical students and residents. Acad Med. 2011;86(8):996-1009; Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, Veloski J, Gonnella JS, The devil is in the third year: a longitudinal study of the erosion of empathy in medical school. Acad Med. 2009;84(9):1182-1191.
15. Petrou L, Mittelman E, Osibona O, Panahi M, Harvey JM, Patrick YAA, Leedham-Green KE, The role of humanities in the medical curriculum: medical students' perspectives. BMC Med Educ. 2021;21(1):179.
16. Wear D, Zarconi J, Kumagai A, Cole-Kelly K, Slow medical education. Acad Med. 2015;90(3):289-293.
17. McLean D, Chiavaroli N, Denniston C, Richardson M, In-verse reflection: structured creative writing exercises to promote reflective learning in medical students. J Med Humanit. 2022;43(3):498-511.

ORCID: Marta Reichlin https://orcid.org/0009-0002-0567-789X
ORCID: Sara Agnelli https://orcid.org/0000-0002-3179-7281
ORCID: Giovanni Leva https://orcid.org/0009-0008-2963-5831
ORCID: Pier Maria Battezzati https://orcid.org/0000-0003-1344-3452