

**TITLE:**

OsteoBPS –Perception of osteopaths with specific undergraduate biopsychosocial training regarding its usefulness in clinical practice: a mixed-method study.

**1. Introduction**

Musculoskeletal pain is among the leading causes of disability worldwide (Vos et al., ) and is a problem for current management in the health care world. It has been shown that psychosocial factors can contribute to the development and maintenance of pain, and correlate with higher levels of pain-related disability (Meints and Edwards, 2018; Jackson et al., 2014). For these reasons, the most recent guidelines for the management of musculoskeletal pain suggest using biopsychosocial approaches (Lin et al., 2020; Pincus et al., 2013). A term described by Main and George (2011) that is often used to describe a biopsychosocial approach is that of psychologically informed physical therapy, in which psychosocial aspects related to the pain experience are included in the assessment and possible management without excluding biomedical management focused on physical complaints. In fact, it is well known that several factors can influence outcomes and the therapeutic relationship including therapeutic alliance (Ferreira et al., 2013), patient expectations (Cormier et al., 2016), empathy (Fatehi et al., 2023) beliefs and attitudes of patients and therapists (Nijs et al., 2013). A psychologically informed physical approach could be very relevant for osteopaths, who are among the categories of professionals who most frequently manage patients with musculoskeletal pain conditions (Ellwood and Carnes, 2021) The above becomes even more relevant when we consider the fact that osteopaths have a primarily biomedical view of pain, focused on finding biomechanical dysfunction and postural aspects to "adjust" and correct (Lederman,2011, Bar-Zaccay and Bailey, 2018). Although there is awareness among osteopaths about the importance of the role that psychosocial factors can play in maintaining and managing pain, there is a lack of confidence and a perception that they lack the skills to manage them (Formica et al., 2018).And it is this lack of confidence, coupled with gaps in professionalization pathways and the perception that using such approaches poses a threat to one's professional identity that is a potential barrier to their application (Formica et al., 2018; Figg-Latham and Rajendran, 2017; Sampath et al., 2021).

To try to overcome this problem, over the past few years, there has been an increase in training offerings for osteopaths especially after basic training aimed at providing skills in biopsychosocial assessment and management of patients with pain (Draper-Rodi et al., 2021; Delion and Draper-Rodi, 2018). To the best of our knowledge there is currently no provision for this type of training in undergraduate pathways. Therefore, it has not yet been possible to investigate osteopaths' perceptions of the training and use of psychologically informed osteopathic treatments through specific undergraduate courses regarding the usefulness and impact on clinical practice of these courses.

The Italian Academy of Osteopathic Medicine (Saronno,Italy) has introduced an experimental course to improve management skills in pain management through psychology-informed practice. The course, called "Pain management," has been delivered within the last two years of training in Master's in Osteopathic Medicine starting in the 2020 academic year by a team of psychologists from the Catholic University of Milan, Italy, who

are experts in both clinical management and teaching the cognitive behavioral aspects of pain.

**Aim:** To explore the perceptions of osteopaths trained within a pre-graduate curriculum on the assessment and management of patients with pain from a biopsychosocial perspective regarding the usefulness, clinical practice implications, limitations and strengths of the training received.

## **2. Methods**

### **Study design**

A mixed methods study was implemented. All professional osteopaths who received training between 2019 and 2021 at the Italian Academy of Osteopathic Medicine in Saronno, Italy, and attended a Pain Management course, were eligible for inclusion in the study. Eligible osteopaths received an email briefly presenting the research and with the link to an online survey, hosted in the Qualtrics software (Qualtrics, Provo, UT). The online survey investigated the attitudes and beliefs regarding their perception of the usefulness of the training received on the topic of pain management from a biopsychosocial perspective, the influence of this training on their clinical practice, and the barriers for the implementation of a biopsychosocial perspective in the clinical practice. Upon completion of the online questionnaire, participants were further invited to participate to a focus group whose data were collected, transcribed verbatim and coded by using qualitative thematic analysis identifying categories, concepts and themes. The aim of the focus group was to explore the strengths and weaknesses of the training they received, its impact on their clinical practice, and gather suggestions for improving future training programs. All participants provided informed consent specific for this study before answering the online survey. The research protocol adhered to the ethical principles outlined in the Helsinki Declaration.

### **Content of the Pain Management course**

All participants had attended independently from this study the Pain Management course provided by the Italian Academy of Osteopathic Medicine. The course was delivered in 60 hours and included face to face lectures, case discussions and experiential exercises.. The contents of the face-to-face lessons included an introduction to pain concepts, the physiology of pain, the biopsychosocial model of pain and the relevant models (e.g., the fear-avoidance model), the measurement of pain and of the relevant psychological factors associated with pain, psychological treatments for pain, psychologically-informed osteopathic care, value-based interventions in pain management, and an introduction to Acceptance and Commitment Therapy (ACT) integrated with the osteopathy practice. Briefly, ACT is a mindfulness-based psychological approach that encourages individuals to cultivate psychological flexibility by embracing their thoughts and feelings while committing to actions aligned with their values (Hayes et al., 2006). This part of the course was inspired and employed the available materials of the OsteoMAP programme, an ACT-

based osteopathy program (Carnes et al., 2017). Case discussions and experiential exercises integrated the face-to-face lessons during the first year, and constituted the content of specific lessons during the second year.

### **Content of the online survey**

The online survey included:

- Questions about sex at birth, age, having undergone additional training courses regarding pain management and the biopsychosocial approach;
- A set of questions on a Likert scale from 1 (“Completely unsatisfied”) to 7 (“Completely satisfied”) investigating the satisfaction regarding: the clarity in the explanations of the theoretical topics provided in the lesson, the exhaustiveness of explanations, the applicability of information to clinical practice, the ability to generate interest in the subject, the time management (speed of didactic progression, alternation of theoretical explanations with examples or exercises)
- A set of questions on a Likert scale from 1 (“Not at all”) to 7 (“Completely”) investigating how much the biopsychosocial approach influences your clinical practice using the following criteria: patient relationship management, diagnostic-clinical reasoning, setting of the treatment program, selection of manual techniques to use with the patient
- A set of questions on a Likert scale from 1 (“Not at all”) to 7 (“Completely”) investigating the perceived usefulness of integrating osteopathic manual treatment with the biopsychosocial approach using the following criteria: patient relationship management, diagnostic-clinical reasoning, treatment program setting, selection of manual techniques to use with the patient
- A multiple-choice question investigating the perceived barriers for the use of the biopsychosocial approach in the clinical care. Possible responses were: the received training is anchored in a biomedical approach; the received training is not sufficient; more confidence in addressing manually (and from a biomechanical point of view) the presumed biomedical causes underlying the symptoms; lack of tools for assessing psychosocial aspects; discordance between the biopsychosocial approach and osteopathic medicine; lack of skills to understand the implicated psychosocial aspects; lack of skills to treat the psychosocial aspects; addressing psychosocial aspects goes beyond the professional competence limits of osteopaths; limitations of the biopsychosocial approach; other. If the options “limitations of the biopsychosocial approach” or “other” were selected, the participants were prompted to provide further specification.

After the completion of the responses to these questions, the participants were asked if they were willing to participate to the focus group and, if they were willing to do so, to provide an email address for receiving the instructions for the participation.

### **Content of the Focus Group**

The second part of the study therefore involved a qualitative method, specifically a thematic analysis with elements of Grounded Theory (Petty et al., 2012). Of those who filled out the survey, 6 indicated their availability for the subsequent interview. The activity

took place in the form of a focus group, lasted approximately 90 minutes and took place in one of the classrooms of the Italian Academy of Osteopathic Medicine. The focus group guideline was created based on information gathered from the survey and existing literature. To encourage dialogue and encourage the participation of all participants and thus generate rich and in-depth information, the management of the discussion was entrusted to a moderator (MR) who did not know the interviewees but was aware of the topics as an osteopath with specific skills in the psychosocial field. A second researcher (SD) participated in the focus group to stimulate and transcribe the information in the form of a memo. The interview was audio-recorded and subsequently transcribed word for word.

### **Data analysis**

Participants received a copy of the transcribed interview for member checking and validation before coding analysis began.

Data from the survey were analyzed using a descriptive approach. Categorical variables were described using counts and percentages, continuous variables using means and standard deviations. The analyses were performed using Microsoft Excel.

Interviews were analyzed using thematic analysis. After "line-by-line" coding was carried out, the next stage of "focused coding" allowed additional categories to be identified. "Selective coding" finally allowed the previously derived categories to be connected and the main themes to be created. The coding process was done by all three researchers (AM, MR, and SD), who talked with each other until a consensus was reached regarding the themes that emerged.

### **Trustworthiness**

Trustworthiness refers to the confidence a reader places toward the results of the study and includes the following elements: credibility, transferability, reliability, and confirmability (Petty et al., 2012-b).

Credibility describes the confidence that the researcher has obtained an accurate interpretation of the meaning of the data, which reflect the participants' experiences. During the study, the research team adopted a critical reflective stance toward the data, aware of personal biases and preconceptions and how these could influence the analysis (Cutcliffe, 2003). Prior to the interviews, efforts were made to develop a trusting relationship with the participants to facilitate the sharing of personal experiences and views. These strategies helped to balance possible bias. In addition, the data that emerged were critically discussed at length among the researchers. Transferability describes the extent to which the ideas generated can be transferred to other populations. In the present study, although the sample size was low, transferability was ensured by rich and contextualized descriptions of the experiences reported by participants, thus enabling others to evaluate the application of the findings in other pedagogical settings. (Petty et al., 2012). Reliability describes the repeatability of the study, while confirmability describes the extent to which the results are the product of the actual focus of the research and not the researcher's biases. Assuring these aspects are the conduct of this study, the writing of memos and the transcription of interviews and related notes. These elements reflect how the researchers developed interpretations, reflections and conclusions during the data analysis, and provides an audit trail documenting each step of the research process.

### 3.Results

#### Online Survey Results

Email invitations were sent to all the ex-students osteopaths. N=36 osteopaths responded to the online survey. 16 participants were male (44.4%), 17 (47.2%) were 20 to 24 years old, 16 (44,4%) were 25 to 29 years old and 3 (8.3%) were 30 to 34 years old. Four participants underwent other courses regarding the biopsychosocial model of pain. Table 1 reports the means and standard deviations of the responses to the items of the online survey investigating the satisfaction with the course, the perception of how much the biopsychosocial approach influences the clinical practice, the usefulness of integrating osteopathic manual treatment with the biopsychosocial approach.

<b>Table 1.</b> Means and standard deviations of the responses to the questions included in the online survey			
		<b>Mean</b>	<b>Standard Deviation</b>
<b>Evaluation of the Pain Management course</b>			
	Clarity in the explanations of the theoretical topics provided in the lesson	5,18	1,24
	Exhaustiveness of explanations,	5,09	1,03
	Applicability of information to clinical practice,	4,39	1,34
	Ability to generate interest in the subject,	4,91	1,54
	Time management (speed of didactic progression, alternation of theoretical explanations with examples or exercises)	4,42	1,59
<b>Influence of the biopsychosocial approach in the participant's clinical practice</b>			
	Patient relationship management	5,53	1,11
	Diagnostic-clinical reasoning,	4,80	1,24
	Setting of the treatment program,	4,73	1,34
	Selection of manual techniques to use with the patient	5,03	1,43
<b>Usefulness of integrating osteopathic manual treatment with the biopsychosocial approach</b>			
	Patient relationship management	5,87	1,01
	Diagnostic-clinical reasoning,	5,07	1,34
	Setting of the treatment program,	5,00	1,39
	Selection of manual techniques to use with the patient	5,27	1,46

Table 2 reports the counts and percentages of the responses regarding the perceived barriers for the use of the biopsychosocial approach in the osteopath's clinical care.

**Table 2.** Frequencies and percentages of the responses regarding the perceived barriers for the use of the biopsychosocial approach in the osteopath's clinical care

<b>Barrier</b>	<b>Frequenc y</b>	<b>Percenta ge</b>
The received training is anchored in a biomedical approach	4	11.11

The received training is not sufficient	3	8.33
More confidence in addressing manually (and from a biomechanical point of view) the presumed biomedical causes underlying the symptoms	15	41.67
Lack of tools for assessing psychosocial aspects	13	36.11
Discordance between the biopsychosocial approach and osteopathic medicine	2	5.56
Lack of skills to understand the implicated psychosocial aspects	8	22.22
Lack of skills to treat the psychosocial aspects	15	41.67
Addressing psychosocial aspects goes beyond the professional competence limits of osteopaths	3	8.33
Limitations of the biopsychosocial approach	2	5.56
Other	2	5.56

The listed limitations of the biopsychosocial approach were the perceived overlap of the professional competencies of the osteopath and those of the psychologist (n=1, 2.78%) and the risk of overlooking the medical and osteopathic component of pain (n=1, 2.78%). The listed additional barriers were related to the difficulty to address the patient's expectations about the hands-on nature of the osteopathic treatment, and the lack of possibility to be supervised when dealing with a patient with psychological comorbidities.

**Focus Group Results**

Data analysis led to the creation of 2 main categories, which describe the personal experiences and perceptions that participants reported about their undergraduate training in the psychosocial field.

- Didactics and training
- Actual practice

These two main categories are in turn made up of several subcategories, which are subsequently presented and expanded upon. Each category is accompanied by quotes from participants, while a schematic representation (fig. 1) graphically summarizes what emerged from the focus group.

Teaching and Training	Professional Practice
<p>+++Positive Elements</p> <ul style="list-style-type: none"> <li>• Recognition of Psychosocial Factors</li> <li>• Usefulness of the Questionnaires</li> <li>• More conscious practice</li> <li>• Vision of the patient beyond the pathology</li> <li>• Importance of self-efficacy and autonomy</li> </ul> <p>---Negative Elements</p> <p>Pain management Course</p> <ul style="list-style-type: none"> <li>• Repetitive Topics</li> <li>• Few Practice (possible role play)</li> <li>• Timetable to review</li> </ul> <p>Teaching-internship gap</p> <ul style="list-style-type: none"> <li>• Supervisor Competence</li> <li>• Role of PS factors underestimate</li> <li>• Clinic Organization</li> </ul>	<p>Osteopathic role/skills uncertainty</p> <ul style="list-style-type: none"> <li>• Psychology-informed practice yes/no?</li> <li>• Difficulty taking charge of PS elements</li> <li>• Institutional void and uncertain professional profile</li> </ul> <p>Management of Psychosocial Elements</p> <ul style="list-style-type: none"> <li>• Recognizing but not knowing how to act/ lack of competence and practical experience</li> <li>• Intuition and natural skills</li> <li>• Professional model needed to follow</li> </ul> <p>Therapeutic Alliance/Therapeutic Relationship</p> <ul style="list-style-type: none"> <li>• Effective communication</li> <li>• Trust and empathy</li> <li>• Self Efficacy</li> <li>• Patient centricity</li> </ul>

Fig. 1

## Teaching and training

The first category encompasses the participants' experiences and opinions about everything related to the training they did and how it relates to the clinic and other courses in the two-year Master's program. Regarding this, each participant highlighted strengths and weaknesses, which constitute two subcategories described below.

### Strengths

Participants highlighted how the Pain Management course enabled them to know how to recognize Psycho-Social (PS) factors related to the pain experience.

According to the participants, knowing on a theoretical level and being able to recognize these elements in the daily clinic is an important skill of the osteopath.

*PM2 "(Recognizing PS elements)..in our work is something that is inescapable, you can't not take into consideration."... "The BPS model is closely related to pain, since we work with people who many times report having pain it is something fundamental."*

The usefulness of the questionnaires introduced and explained during the course was highlighted. This usefulness lies in the possibility of being able to do an initial screening of the patient, being able to identify psychological or social elements that might accompany and relate to the clinical presentation. In addition, the questionnaires were also described as tools for objectifying improvements to the patient(s), remarking on them if the patient(s) failed to notice them

PM4 "For example, the Tampa Scale of Kinesiophobia, or the Brief Pain Inventory, all those questionnaires allow you to go and assess these PS aspects...and they have scientific validity."

PM3 "you can discuss over time with the patient using the questionnaire. "Okay we are at the fifth session, do you redo this questionnaire, do we compare it with the one from the first day? What has changed? Why did it change? That is, how did you change and therefore did the outcome change? How did your behaviors change and therefore did the result of the questionnaire change?"

Considering and recognizing PS elements allows for a more comprehensive view of the patient, one that does not dwell only on purely biomechanical and musculoskeletal aspects and allows for a focus not solely on pathology. Consequently, intervening on these factors would allow for better osteopathic treatment outcomes.

*PM1 "seeing a person beyond the biomechanical level, a person with emotions, which may affect perhaps even a tense state of the musculature"*

*PM3: (an approach informed by psychology...) It helps to contextualize why the patient has a certain type of behavior, which may or may not be constructive. It then helps to understand what behaviors you can actually start working on.*

*PF2 "all the PS elements that I perceive of the patient in the history can be useful for me to understand the patient, his pain, and how he handles the pain."*

Thus, the "Pain Management" course enabled students to develop greater awareness in clinical practice. Knowledge of PS components that might contribute to a patient's symptomatology provided additional insight into the patients themselves, making practice more mindful and self-reflective.

*PM1 "Whereas before I used to go a little bit on instinct...After the course I learned how to think consciously, I know that there can be this process going on, I know that there are these factors, these are things that I interpret accordingly in a different way, because I am aware of it...It was really a distinction between before that you just go on instinct, to after that you rework and integrate with more awareness the information you had in class"*

*PM3 "(After the course) I am much more aware of what I do. I have been given tools to analyze what I do and improve it even independently. That is, in my opinion, awareness of what you do is the basis then for improvement."*

Students, emphasized the importance of encouraging patient autonomy so as not to create a dependence on osteopathic treatment, empowering the patient of his or her role in the care pathway.



*PM3 "guiding the patient to learn independently, to manage his condition independently is the most important part of the treatment...Because it is much more effective to bring the patient to understand independently what is actually best for him"... "I have to guide you to manage your body, always based on the evidence and everything, however, I have to teach you to work independently. I can give the patient small inputs that he then uses effectively in everyday life."*

*PM4 "The patient also needs to learn not to be treatment dependent, to bring safety and confidence into everyday life.... Guiding him to learn independently how to handle these situations is the most important part of treatment in my opinion, because they represent the real situation in his life, which is not possible to achieve with manual osteopathic treatment."*

## **Weaknesses**

The weaknesses pointed out by participants concern the course itself, but also its integration with the curricular internship.

## **Methods of teaching**

A limitation emerged regarding the way the lectures were conducted, which were too theoretical and not very practical. For this reason, students did not perceive themselves developing practical skills to know how to handle psychosocial factors after recognizing them.

*PM4 "within such a course there should be a theoretical part and then a practical part, like for osteopathic subjects, where anyway both the knowledge part and the more practical skills part are carried out... with real clinical cases, role playing, or any other situation that succeeds in giving a practical implication, it should be a training ground that gives me confidence in handling patients."*

*PF2 "I missed some of the practical applicability, they almost seemed like things that were a bit of an end in themselves...in the sense useful as knowledge, however, then in application I found a bit of a void...How do I do these things? How do I add them into my clinical practice?"*

## **Consistency and connection between different departments.**

Another critical issue identified lies in the lack of integration and communication between departments and training subjects over the years or in the same year. It is likely that there are also inconsistencies in the messages conveyed between departments making this course disconnected from the others.

*PM1 "like maybe **POS** (a hands-on practical subject) serves to make you contextualize knowledge that you learn in other subjects, the Pain Management course should do the same. So it would take more communication, more of a comparison. For example, a talk like the one we are having now would be useful among the different faculty from different departments; because then you can have a connection."*

*PM3 "The problem with pain management is that it is a course in the last two years that...sometimes it is disconnected from the other subjects as well."*

### **Teaching-internship gap**

Participants also stressed the need to have mentors, within the clinic, who possess in-depth skills in managing the psychosocial aspects of patients. Indeed, participants pointed out that in-depth study of psychosocial elements was superficial or completely absent during clinical internship. This was an additional obstacle in the possible clinical transfer of theoretical knowledge.

*PM4 "Just as there are osteopaths in the clinic who follow pediatrics, similarly one could put tutors trained on handling the psychosocial aspects of a person"*

*PM1 "Having a tutor trained in PS, maybe even just the fifth year during the first visits, would help so much, to point out on a real patient the most important PS aspects...it would be the most formative thing." "In the clinical part in my opinion there is a lack of training at the level of the tutors, so there is no stimulation coming from them" "If pain management content was brought to the clinic, many times it was not understood, in fact it was snubbed by the tutors"*

*PF2 "In clinical practice in cfto, almost all of this part for me has been almost nonexistent, that is, on the part of tutors it is as if this part did not exist; therefore, maybe even we in the internship years practiced without using all of this part" Inoltre gli studenti hanno evidenziato come alcuni elementi organizzativi della clinica siano essi stessi un ostacolo all'impiego di una terapia osteopatica informata dalla psicologia.*

In addition, students pointed out that some organizational elements of the clinic are themselves an obstacle to using osteopathic therapy informed by psychology.

*PF1 "You have 8 observers inside, tutors coming in and out, so it's hard to have this kind of relationship with the patient."*

*PM3 "In the clinic, where people come in and out, it's always an interruption and clearly you also have that aspect, I don't know whether to call it a contextual factor, but you there, by the patient you're not really seen with a practitioner and this thing doesn't allow you to put certain skills into practice."*

## **Real practice**

The second main category represents views and personal experiences that participants reported regarding osteopathic clinical practice following training at AIMO.

## **Professional role and identity**

As much as there was recognition by the participants of the importance of the role of psychosocial factors and the importance of building a therapeutic alliance with the patient, it is unclear whether in the professional role, the osteopath should have expertise in managing these aspects in people with musculoskeletal pain and what is the perimeter in which they are allowed to act.

*PM2: "Now I haven't read the osteopath's core curriculum competencies very well. From my perspective, though, I don't know exactly what my limitation is."*

*PF2: "I within the course didn't really understand when managing from a psychological perspective a patient's pain is something that's up to me, that is unless it's a severe thing, a severe depression that then I need to refer the patient, in less severe circumstances I can recognize them but I don't know if I can manage them."*

Some participants believe that managing the psychosocial aspects of a person's pain is beyond one's professional role and that, as important as their recognition is in the overall pain assessment, the patient when presenting with yellow flags should be referred to another professional.

*PM1: "In my opinion it is great that it gives us all the skills to identify all the yellow flags and all the factors, so that we can then refer him to a professional who is specific to that."*

However, other participants brought up that limitations and one's scope of practice also closely relate to a lack of clinical confidence.

*PF2: "In my opinion in part they can be addressed by the osteopath, however, I cannot say to what extent. I've tried, however, it's like it's something in which I don't feel capable.... I would look for a way to deepen the topics also because I realize that it is a limitation, in the sense that I get up to there and then from there there there would be more that I could do, which however I am not able to do."*

## **Management of psychosocial factors**

The perception of feeling confident in offering psychologically informed osteopathic therapy was emphasized by most participants when it related to being an empathic

therapist, able to put the patient at the center of the recovery journey and build a therapeutic alliance. Empathy was recognized by all as an important element to develop during treatments, facilitating trust and attunement with the patient.

*PM3 "it's a very important part of treatment to create a therapeutic alliance with the patient, and empathy I think is one of the keys to connecting with the patient."*

*PM1 "Using empathy helps me to establish a relationship that does not have to be an odd relationship between the therapist and the patient. There still has to be a commonality of purpose."*

*PM2 "I don't like to call him a patient, but I like to see him as a person, even before his pathologies. So ,the idea is to put the person at the center, put the person first and understand who you have in front of you, understand what they are going through at that moment, then you activate all those mechanisms of trust and therapeutic alliance."*

For other students, however, in addition to the recognition of the importance of building a relationship made up of trust and alliance using an empathic communication style, there is also the recognition of the importance of developing other skills to better manage a person's psychosocial factors. Indeed, one participant pointed out that empathy should be an inherent and taken for granted characteristic for a job such as that of an osteopath.

*PF1 "Okay, I have to be empathetic, but I say I already know this, I mean it's not enough for me to know this because I think if you choose such a profession, a minimum of empathy you have to be, I mean if you don't like to be with people maybe you made a mistake."*

Finally, for a participant, managing psychosocial factors offers the possibility of using psychological techniques to facilitate the execution of manual techniques.

*PM1 "For me breathing exercises, mindfulness exercises can be useful and helpful strategies in allowing me to do my job better. That is, for example, a patient who is very stiff and very tense, they don't let go. I apply what can be a breathing and mindfulness talk, to be facilitated."*

#### 4. Discussion

The objective of this study was to explore osteopathic students' perceptions of the pregraduate training they received regarding a psychologically informed intervention for the management of musculoskeletal pain. The results emerging from this study highlight two themes: one relating to the teaching and training received and one relating to the application with real patients of the contents learned for pain management in professional practice. The introduction of this course allowed students to expand their knowledge regarding the multidimensional nature of pain, and as a result, students increased their levels of clinical awareness and pain framing of their patients. All students emphasized the importance of managing and framing pain through a biopsychosocial lens. Other qualitative studies highlight that psychologically informed physical therapy training leads to this increased awareness, underscoring the importance of this topic (Barker et al., 2016; Cowell et al., 2019; Nielsen et al., 2014). Some of the participants viewed positively the possible use of questionnaires as tools to better understand the patient's painful condition also recognizing obstacles to recovery as also highlighted in the study by Hsu and colleagues (2019). All of this, led to clinical benefits; in fact, students understood the importance of providing person-centered care and felt more adept at establishing therapeutic alliances with their patients. A real shift was reported by students in seeing their patients no longer as bodies to be adjusted but as people with emotions, beliefs, behaviors, and social contexts in which they are embedded. As a consequence, some students reported paying more attention to the person's needs, to using shared decision-making processes and a less paternalistic communication style. Such changes have also been described elsewhere (O'Sullivan et al., 2013; Kelly et al., 2018; Lawford et al., 2018).

Nevertheless, increased knowledge and awareness in framing the patient has not translated into increased clinical confidence in managing patients' pain-related psychosocial factors. Some systematic reviews conducted on physical therapists, highlight how physical therapists themselves believe that there is inadequate training to increase their skills in managing the patient from a psychological perspective as well (Alexanders et al., 2015; Driver et al., 2017). The same is also true for osteopaths Sampath et. Al 2021, Formica et al 2019. It is possible that students did not develop clinical confidence because, as revealed by their perceptions, they lacked professional osteopaths who could do adequate mentoring in line with the concepts learned during the course. Some studies, highlight the importance of mentoring in translating knowledge learned from psychologically informed physical therapy courses, into one's clinical context, and those who did not have this opportunity desired it just as much as the osteopathy students in this research (Cowell et al., 2018; Hsu et al., 2019; Kelly et al., 2018; Lawford et al., 2018; Nessen et al., 2014; Richmond et al., 2018). Another factor could be due to the teaching method; in fact, as much as frontal methods in which solid and convincing scientific evidence is presented have been appreciated in some research (O'Sullivan et al., 2013), there has been a lack of real training to familiarize with the theory behind a physical approach informed by psychology. This training has been positively evaluated in other studies in which a biopsychosocial approach was proposed to physical therapists (Kuss et al., 2016; , Lawford et al., 2018; Nielsen et al., 2014), and methodologies such as role play could provide an excellent learning opportunity

as reported by several studies (Cowell et al., 2019; Nessen et al., 2014, Nielsen et al., 2014).

**5 Conclusions:** From this study emerges that the introduction of a course on the psychosocial management of pain in an osteopathic training course at pregraduate level was on the one hand appreciated but at the same time is been recognized the difficulty of its application in clinical practice. The course was appreciated above all for having introduced knowledge that has raised awareness among future osteopathic professionals regarding the recognition of those non-biological elements that can play a role in the perception and maintenance of pain. However, from the analysis of both qualitative and quantitative data, the difficulty in the applicability of the proposed method was also recognized. It emerges that one of the main reasons for this difficulty can be traced back to the ways in which the course was delivered over the two academic years. The reduced transferability of knowledge and skills learned theoretically in the classroom to the context of academic clinical training with seems one of the elements to have undermined confidence in psychosocial management with patients subsequently encountered during professional activity.

**Funding** This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

-

**Ethical approval** The study protocol was reviewed and then approved by Comitato di Revisione Etica (CRE) of AIMO N° I 2022/01-001Milan according to the standards of the Declaration of Helsinki, and the recommendation of the National Committee on Bioethics.

-

**Declaration of competing interest** The authors declare no conflict of interest. This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

## Bibliografia

Alexanders, J., Anderson, A., & Henderson, S. (2015). Musculoskeletal physiotherapists' use of psychological interventions: a systematic review of therapists' perceptions and practice. *Physiotherapy*, 101(2), 95-102.

Barker, K. L., Heelas, L., & Toye, F. (2016). Introducing acceptance and commitment therapy to a physiotherapy-led pain rehabilitation programme: an action research study. *British Journal of Pain*, 10(1), 22-28.

OsteoBPS –Perception of osteopaths with specific undergraduate biopsychosocial training regarding its usefulness in clinical practice: a mixed-method study.  
Maggiani Alberto, P.T, BSc,D.O

Bar-Zaccay, A., & Bailey, D. (2018). The attitudes and beliefs of UK osteopaths towards the management of low back pain: a cross-sectional study. *International Journal of Osteopathic Medicine*, 28, 42-47.

Carnes, D., Mars, T., Plunkett, A., Nanke, L., & Abbey, H. (2017). A mixed methods evaluation of a third wave cognitive behavioural therapy and osteopathic treatment programme for chronic pain in primary care (OsteoMAP). *International Journal of Osteopathic Medicine*, 24, 12-17.

Ellwood, J., & Carnes, D. (2021). An international profile of the practice of osteopaths: a systematic review of surveys. *International Journal of Osteopathic Medicine*, 40, 14-21.

Cormier, S., Lavigne, G. L., Choinière, M., & Rainville, P. (2016). Expectations predict chronic pain treatment outcomes. *Pain*, 157(2), 329-338.

Cowell, I., O'Sullivan, P., O'Sullivan, K., Poyton, R., McGregor, A., & Murtagh, G. (2019). The perspectives of physiotherapists on managing nonspecific low back pain following a training programme in cognitive functional therapy: A qualitative study. *Musculoskeletal Care*, 17(1), 79-90.

Cutcliffe, J. R., & McKenna, H. P. (2004). Expert qualitative researchers and the use of audit trails. *Journal of advanced nursing*, 45(2), 126-133.

Delion, T. P. E., & Draper-Rodi, J. (2018). University College of Osteopathy students' attitudes towards psychosocial risk factors and non-specific low back pain: a qualitative study. *International Journal of Osteopathic Medicine*, 29, 41-48.

Draper-Rodi, J., Vogel, S., & Bishop, A. (2021). Effects of an e-learning programme on osteopaths' back pain attitudes: a mixed methods feasibility study. *Pilot and Feasibility Studies*, 7(1), 1-18.

Driver, C., Kean, B., Oprescu, F., & Lovell, G. P. (2017). Knowledge, behaviors, attitudes and beliefs of physiotherapists towards the use of psychological interventions in physiotherapy practice: a systematic review. *Disability and rehabilitation*, 39(22), 2237-2249.

Sampath, K. K., Darlow, B., Tumilty, S., Shillito, W., Hanses, M., Devan, H., & Thomson, O. P. (2021). Barriers and facilitators experienced by osteopaths in implementing a biopsychosocial (BPS) framework of care when managing people with musculoskeletal pain—a mixed methods systematic review. *BMC health services research*, 21(1), 1-15

OsteoBPS –Perception of osteopaths with specific undergraduate biopsychosocial training regarding its usefulness in clinical practice: a mixed-method study.  
Maggiani Alberto, P.T, BSc,D.O

Fatehi, A., Brown, L. E., Versluijs, Y., Van Maren, K., Ring, D., Gonzalez, A., & Ramtin, S. (2023). The relationship of perceived empathy with levels of pain intensity and incapability among patients visiting a musculoskeletal specialist. *Patient Education and Counseling*, 115, 107900.

Ferreira, P. H., Ferreira, M. L., Maher, C. G., Refshauge, K. M., Latimer, J., & Adams, R. D. (2013). The therapeutic alliance between clinicians and patients predicts outcome in chronic low back pain. *Physical therapy*, 93(4), 470-478.

Figg-Latham, J., & Rajendran, D. (2017). Quiet dissent: the attitudes, beliefs and behaviours of UK osteopaths who reject low back pain guidance—a qualitative study. *Musculoskeletal Science and Practice*, 27, 97-105.

Formica, A., Thomson, O. P., & Esteves, J. E. (2018). 'I just don't have the tools'-Italian osteopaths' attitudes and beliefs about the management of patients with chronic pain: a qualitative study. *International Journal of Osteopathic Medicine*, 27, 6-13.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour research and therapy*, 44(1), 1-25.

Hsu, C., Evers, S., Balderson, B. H., Sherman, K. J., Foster, N. E., Estlin, K., ... & Cherkin, D. (2019). Adaptation and implementation of the STarT back risk stratification strategy in a US health care organization: a process evaluation. *Pain Medicine*, 20(6), 1105-1119.

Jackson, T., Wang, Y., Wang, Y., & Fan, H. (2014). Self-efficacy and chronic pain outcomes: a meta-analytic review. *The Journal of Pain*, 15(8), 800-814.

Kelly, J. M., Bunzli, S., Ritchie, C., Kenardy, J., Smeets, R., & Sterling, M. (2018). Physiotherapist-delivered stress inoculation training for acute whiplash-associated disorders: a qualitative study of perceptions and experiences. *Musculoskeletal science and practice*, 38, 30-36.

Kuss, K., Leonhardt, C., Quint, S., Seeger, D., Pflingsten, M., Wolf PT, U., ... & Becker, A. (2016). Graded activity for older adults with chronic low back pain: program development and mixed methods feasibility cohort study. *Pain Medicine*, 17(12), 2218-2229  
Lawford, B. J., Delany, C., Bennell, K. L., Bills, C., Gale, J., & Hinman, R. S. (2018). Training physical therapists in person - centered practice for people with osteoarthritis: a qualitative case study. *Arthritis care & research*, 70(4), 558-570.

Lederman, E. (2011). The fall of the postural-structural-biomechanical model in manual and physical therapies: exemplified by lower back pain. *Journal of bodywork and movement therapies*, 15(2), 131-138.



OsteoBPS –Perception of osteopaths with specific undergraduate biopsychosocial training regarding its usefulness in clinical practice: a mixed-method study.  
Maggiani Alberto, P.T, BSc,D.O

Lin, I., Wiles, L., Waller, R., Goucke, R., Nagree, Y., Gibberd, M., ... & O'Sullivan, P. P. (2020). What does best practice care for musculoskeletal pain look like? Eleven consistent recommendations from high-quality clinical practice guidelines: systematic review. *British journal of sports medicine*, *54*(2), 79-86.

Main, C. J., & George, S. Z. (2011). Psychologically informed practice for management of low back pain: future directions in practice and research. *Physical therapy*, *91*(5), 820-824.

Meints, S. M., & Edwards, R. R. (2018). Evaluating psychosocial contributions to chronic pain outcomes. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *87*, 168-182.

Nessen, T., Opava, C. H., Martin, C., & Demmelmaier, I. (2014). From clinical expert to guide: experiences from coaching people with rheumatoid arthritis to increased physical activity. *Physical therapy*, *94*(5), 644-653.

Nielsen, M., Keefe, F. J., Bennell, K., & Jull, G. A. (2014). Physical therapist–delivered cognitive-behavioral therapy: a qualitative study of physical therapists' perceptions and experiences. *Physical therapy*, *94*(2), 197-209.

Nijs, J., Roussel, N., Van Wilgen, C. P., Köke, A., & Smeets, R. (2013). Thinking beyond muscles and joints: therapists' and patients' attitudes and beliefs regarding chronic musculoskeletal pain are key to applying effective treatment. *Manual therapy*, *18*(2), 96-102.

O'Sullivan, K., O'Sullivan, P., O'Sullivan, L., & Dankaerts, W. (2013). Back pain beliefs among physiotherapists are more positive after biopsychosocially orientated workshops. *Physiotherapy Practice and Research*, *34*(1), 37-45.

Petty, N. J., Thomson, O. P., & Stew, G. (2012-b). Ready for a paradigm shift? Part 2: Introducing qualitative research methodologies and methods. *Manual therapy*, *17*(5), 378-384.

Petty, N. J., Thomson, O. P., & Stew, G. (2012-a). Ready for a paradigm shift? Part 1: Introducing the philosophy of qualitative research. *Manual therapy*, *17*(4), 267-274.

Pincus, T., Kent, P., Bronfort, G., Loisel, P., Pransky, G., & Hartvigsen, J. (2013). Twenty-five years with the biopsychosocial model of low back pain—is it time to celebrate? A report from the twelfth international forum for primary care research on low back pain. *Spine*, *38*(24), 2118-2123.

Richmond, H., Hall, A. M., Hansen, Z., Williamson, E., Davies, D., & Lamb, S. E. (2018). Exploring physiotherapists' experiences of implementing a cognitive behavioural approach

OsteoBPS –Perception of osteopaths with specific undergraduate biopsychosocial training regarding its usefulness in clinical practice: a mixed-method study.  
Maggiani Alberto, P.T, BSc,D.O

for managing low back pain and identifying barriers to long-term implementation.  
*Physiotherapy*, 104(1), 107-115.

Sampath, K. K., Darlow, B., Tumilty, S., Shillito, W., Hanses, M., Devan, H., & Thomson, O. P. (2021). Barriers and facilitators experienced by osteopaths in implementing a biopsychosocial (BPS) framework of care when managing people with musculoskeletal pain—a mixed methods systematic review. *BMC health services research*, 21(1), 1-15.

Vos, T., Lim, S. S., Abbafati, C., Abbas, K. M., Abbasi, M., Abbasifard, M., ... & Bhutta, Z. A. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, 396(10258), 1204-1222.