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Attitudes, skills, and use of evidence-based practice of French osteopaths who teach

A cross-sectional survey

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In France, the only legal requirement to teach in an Osteopathic Educational Institution (OEI) is to have been an osteopath for five years. As a result, OEIs across France are staffed by educators with different professional and academic profiles and backgrounds. The purpose was to explore to which extent osteopaths who teach engage in evidence-based practice (EBP). Thus, the aim was to explore the attitudes, skills, and use of EBP among French osteopaths who teach in two OEIs.

A cross-sectional survey was conducted in two French OEIs, the Institut d'Ostéopathie de Rennes-Bretagne (IO-RB), France and the Centre Européen d'Enseignement Supérieur de l'Ostéopathie (CEESO), France. Educators (n=134) were invited to complete the French-translated and culturally adapted version of the Evidence-Based Practice Attitude and Utilisation Survey (EBASE-Fr) online. The survey comprises seven constructs: attitude, skills , education and training, use, barriers, enablers, and socio-demographics. The attitude, skills, and use items can be regrouped to create subscores. Associations between the characteristics (e.g., demographics, education background) of teaching osteopaths and their attitudes, skills and use reported level of EBP were explored.

Of the 134 teaching osteopaths contacted, 45% completed the EBASE-Fr questionnaire. Most participants were male (70%), between 30 and 39 years old (66,7%). Respondents reported overall positive attitudes towards EBP, with most agreeing that EBP helps in making decisions about patient care (80%) and is necessary for osteopathic practice (88%). Respondents perceived their skills in EBP to be moderately-high and reported low levels of engagement in EBP activities in the 30 days before study enrolment.

To conclude, French osteopaths who teach generally supported EBP, despite moderately-high EBP skills and low engagement in EBP activities. Future research should focus on conducting effective interventions to improve faculty development in EBP and its subsequent implementation in the curriculum.

Keywords	evidence-based practice, osteopathic medecine, education

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1 Introduction

Osteopathy is a person-centred manual healthcare approach whose diagnostic and therapeutic foundation has historically been embedded within a specific set of concepts and principles (Vogel & Zegarra-Parodi, 2022). Subsequently, education in osteopathy healthcare has for many years existed based on clinicians' opinions and supported by anatomical, physiological and biomechanical models that looked believable in light of the available evidence at the time of initial development (Fryer, 2008). The global community has engaged in extensive discussions regarding the significance of research evidence in guiding osteopathy practice and clinical decision-making (Fryer, 2008; Licciardone, 2008, 2009; Steel et al., 2017; Thomson et al., 2011; Vogel, 2015). Considering their significant role, it falls under the responsibility of osteopathy educators to encourage critical reasoning and the integration of evidence-based practice (EBP) in the clinical care of patients (Vaughan et al., 2019), moderating anecdotal and evidence-based perspectives (Sposato et al., 2018), and finding a way between osteopathic heritage and current research (Ménard et al., 2020). This educational shift is all the more crucial if we consider the influence of educators' opinions on osteopathy students' clinical decision-making process, such as applying clinical guidelines for managing back pain (Figg-Latham & Rajendran, 2017), for example, or shaping students' beliefs towards chronic low back pain sufferers (Mhadhbi et al., 2021). Though, only a few studies have previously explored the characteristics of osteopaths who teach (Orrock et al., 2021; Vaughan, 2018).

EBP is defined as a conscientious process of incorporating the research evidence with the practitioner's expertise and the patient's values and preferences to give the best shared and consented decisions about patient care (Sackett et al., 1996). EBP aims to provide high-quality, effective care tailored to the individual patient's needs and preferences within the patient's environmental context (Sackett et al., 2000). Despite the broad support for EBP and its benefits regarding patients' safety, its integration into health care policy has been done on a case-by-case basis, facing different barriers across health professions (Warren et al., 2016). This can be linked to difficulties in translating the findings of research into patient-centred care (MacDermid & Graham, 2009). The challenges of applying EBP to complex clinical presentations using complex interventions may be additional barriers to the adoption of EBP (Greenhalgh et al., 2014). These concerns have been emphasized by almost all healthcare professions, including physiotherapists (Scurlock-Evans et al., 2014), nurses (Williams et al., 2015),

chiropractors (Hall, 2011), paediatric surgeons (Sullivan et al., 2017), psychologists (Lilienfeld et al., 2013), general practitioners (Zwolsman et al., 2012), dentists (Coleman et al., 2016), midwives (Dagne & Beshah, 2021), radiologists (Lavelle et al., 2015), psychiatrists (Hannes et al., 2010), nutrition professionals (Laville et al., 2017), and healthcare educators (Lehane et al., 2019). These issues have, of course, also been discussed in the framework of the implementation of EBP in the osteopathic practice context of care (Weber & Rajendran, 2018).

In France, osteopathy is taught in private Osteopathic Educational Institutions (OEIs) not associated with universities. The practice has been regulated since 2002 (Légifrance, 2002) and has had an official curriculum since 2014 (Légifrance, 2014). However, being an osteopath for five years is the only requirement to teach in an OEI. Consequently, we can think that educators with different professional and academic profiles and backgrounds operate in OEIs across France. This role leads to giving osteopathic educators, researchers in the field of osteopathic education, and OEIs specific challenges in creating a future professional body aligned with global public health policies.

Some recent studies have evaluated attitudes, skills, and evidence-based practice (EBP) among osteopathy practitioners (Alvarez et al., 2021; Cerritelli et al., 2021; Leach et al., 2019, 2020; Sundberg et al., 2018) using the Evidence-Based Practice Attitude and Utilisation SurvEy (EBASE). However, to our knowledge, none of these studies has explicitly studied the specific educator population nor French osteopaths. In response to this knowledge gap, the aim is to explore the attitudes, skills, and use of EBP among French osteopaths who teach in two OEIs. The purpose is to improve educator qualification, EBP enactment and its implementation into the French osteopathic educational context.

2 Theoretical background

2.1 Evidence-based practice

It is generally accepted that EBP has philosophical roots in medical thinking of the mid-19th century in France and earlier (Sackett et al., 1996). Evidence-based medicine can be defined as using current best evidence for individual patient care decisions (Sackett et al., 2000). Individual clinical experience is combined with the best available external clinical data from systematic research in the practice of evidence-based medicine (McKibbon, 1998). The definition of evidence-based medicine was eventually renamed

evidence-based practice because it was accepted by other professions, particularly healthcare professions (Mackey & Bassendowski, 2017).

Sackett et al. (2000) suggest the following five steps:

1. Convert the information requirement (prevention, diagnosis, prognosis, treatment, causation, etc.) into a clinical question that may be addressed.
2. To answer this question, find the best accessible evidence.
3. Evaluate the validity (lack of bias), impact (effect size), and application (usefulness in a specific clinical practice environment) of this data.
4. Combine this critical evaluation with the practitioner's clinical expertise and integrate this critical evaluation with the practitioner's therapeutic expertise and the patient's unique features, values, and circumstances.
5. Assess the clinical decision's effectiveness and your own personal efficiency in completing steps 1–4.

The questions that form the basis of the approach are not questions about general knowledge about a concept (background questions) but rather foreground questions, the main elements of which are listed under the acronym PICO for a systematic review (McKibbon & Marks, 2001; Rosswurm & Larrabee, 1999):

- P = Patient/problem: the patient's situation, population, or problem.
- I = Intervention: a programme, intervention method, diagnostic test, prognostic factor, treatment.
- C = Control/comparison (if relevant): a baseline or type of care as a point of comparison for the chosen intervention; the comparison of two interventions or exposures.
- O = Objectives: the goals to be achieved, the clinical events of interest, which may have a time dimension.

A scoping review will have a larger "scope" with fewer strict inclusion criteria considering a research topic based on the acronym PCC (Population, Concept, and Context). The scoping review may use data from any source of evidence and research approach and is not limited to quantitative studies (or any other type of research design) alone (Aromataris & Munn, 2020).

PEO is an acronym that helps create a search strategy for finding research to answer a qualitative research question (Patient/Population/Problem, Exposure, Outcome) (Munn et al., 2018).

EBP has resulted in significant improvements in patient quality and safety while also cutting costs. Several professional organisations and international authorities have compiled study findings into practice recommendations for physicians to employ to enhance healthcare outcomes (Wachter et al., 2013). Implementing evidence-based safety-oriented care practice is challenging, and solutions are required that consider the complexity of healthcare delivery systems, individual professionals, and educators, and changing healthcare cultures to promote evidence-based safety-oriented practice settings (Henriksen et al., 2005). Several models of evidence-based practice are commonly used in healthcare. These models serve as organizing guides that integrate current research to create the best patient care practices (Christenbery, 2017). Among these models, we can mention:

- The Iowa model of EBP (Titler et al., 2001) guides clinical decision-making and evidence-based practice implementation from the patient, the practitioner, and organizational perspectives.
- The Stetler model (Stetler, 2001) looks at how evidence can be used to create formal change within organisations, and how professionals can use research in critical thinking and reflective practice sessions.
- The Promoting Action on Research Implementation in Health Services (PARiHS) Framework (Bergström et al., 2020) The framework offers an approach for translating research into practice by looking at the connection of three crucial elements: (a) evidence, (b) context, and (c) facilitation.
- The Johns Hopkins Nursing Evidence-Based Practice Model (Dang et al., 2021) is intended to satisfy the EBP needs of direct care nurses through a straightforward three-step procedure known as PET: (a) Practise Question, (b) Evidence, and (c) Translation.

One of the main challenges in addition to a positive attitude towards EBP, is the clinical translation and adoption of good practice from research laboratories to the patient and health practitioner (Rubenstein & Pugh, 2006), as this translational process may take years (Morris et al., 2011). The study of methods, procedures and factors that impact the adoption of EBP by individuals, professional stakeholders, and organisations for improving clinical decision-making in the healthcare sector is known as translation science (Pearson et al., 2012). Translation studies involve, for example, characterising

barriers and enablers to knowledge application, determinants of adherence to EBP standards, attitudes towards EBP, and defining the scientific field's structure (Kirchhoff, 2004).

2.2 Osteopaths' attitudes, skills, and use of EBP

Several studies using the EBASE questionnaire as a measurement tool have studied the attitudes, skills, and use of EBP among osteopaths in the United Kingdom (Sundberg et al., 2018), in Australia (Leach et al., 2019), in Sweden (Leach et al., 2020), in Italy (Cerritelli et al., 2021), and in Spain (Alvarez et al., 2021) (see Table 1). All these mentioned studies highlighted the overall positive reported attitudes toward EBP by osteopaths, with most agreeing that EBP is necessary in the practice of osteopathy, assists in clinical decision-making and improves quality of care. The attitudes sub-scores were the following: 30 (IQR 26, 33; range 11–40) in the UK, 31 (IQR 27, 34; range 15–40) in Australia, 30 (IQR 28, 34; range 16–39) in Sweden, 31 (IQR 29, 34; range 8–40) in Italy, and 32 (IQR 28,3 5; range 11–40) in Spain.

Most authors found that osteopaths reported moderate-level skills with the following sub-scores: 39 (IQR 32, 45; range 13–65) with Sundberg et al. (2018) in the UK, 40 (IQR 33, 46; range 15–65) with Leach et al. (2019) in Australia, 38 (IQR 33,45; range 13–64) with Cerritelli et al. (2021) in Italy 39 (IQR 31, 48; range 13–65), and 39 (IQR 31, 48; range 13–65) with Alvarez et al. (2021) in Spain. Only the study by Leach et al. (2020) with Swedish osteopaths reported moderate to high reported perceived skills with a sub-score of 42 (IQR 36, 48; range 19–63).

All the studies mentioned above found a moderately-low level of engagement and use of EBP among osteopaths with osteopaths typically engaging 1-5 times in EBP activities over the last month. The utilisation subscores were the following: 12 (IQR 11,15; range 6–30) among British osteopaths, 7 (IQR 5,11; range 0–24) among Australian osteopaths, 9 (IQR 5,17; range 0–24) among Swedish osteopaths, 13 (IQR 13,17; range 6–30) among Italian osteopaths, and 8 (IQR 5,14; range 0–24) among Spanish osteopaths. These activities were mostly reported as using online search engines and reading professional literature.

Table 1. Overview of studies which used the EBASE questionnaire among osteopaths with subscores results.

Author	Year of publication	Country	Number of respondents	Attitude subscore	Skills subscore	Use subscore
Sundberg	2018	United Kingdom	375	30	39	12
Leach	2019	Australia	368	31	40	7
Leach	2020	Sweden	78	30	42	9
Cerritelli	2021	Italy	473	31	39	13
Alvarez	2021	Spain	567	32	39	8

To summarize the current literature, osteopaths hold a largely positive view of EBP, report moderate skills, and have a low engagement and use of EBP. Nevertheless, global enthusiasm exists among respondents for building the knowledge and skills required to implement EBP into clinical care. The authors (Alvarez et al., 2021; Cerritelli et al., 2021; Leach et al., 2019, 2020; Sundberg et al., 2018) all agreed that a pedagogical change towards fostering a culture of critical thinking and reflective practice and a more significant incorporation of osteopathic training courses in university settings might help osteopaths adopt EBP.

2.3 Barriers and enablers for adopting EBP in osteopathic clinical and educational context

Osteopathic decision-making in practice is embedded in historical traditional concepts and principles based on theories and findings made by key figures early in the profession's history (Zegarra-Parodi et al., 2023). Many of these theories based on anatomy, physiology, and biomechanics were acceptable when they were enunciated, given the body of knowledge available at this time (Fryer, 2008). However, educators and academics from osteopathy tend to criticise and have issues defending some foundational theories and models of osteopathic care (Fryer, 2016; Gabutti & Draper-Rodi, 2014; Hartman, 2006; Lunghi et al., 2016; McGrath, 2015; Smith, 2019; Thomson & MacMillan, 2023; Vogel, 1994, 2015; Zegarra-Parodi et al., 2023). Moreover, a recent editorial published in the International Journal of Osteopathy called for a global update of models and theoretical frameworks for osteopathic care (Esteves et al., 2020). This paper by Esteves, et al. (2020) argues that: “the profession could indeed benefit from mobilising resources to promote new insights on our practice and modernise our views on what we do as healthcare providers”. It raised answers and reactions from all over the world: from Australia (Steel et al., 2020), Spain (Alvarez et al., 2020), France (Ménard et al., 2020), Portugal (Santiago et al., 2020), Italy and Germany (Lunghi & Liem,

2020), Brazil (Nesi, 2020), and New Zealand (Sampath & Fairs, 2020). While all authors agreed on the call for an updated osteopathic care framework, most tried to highlight and set specific local contexts that can enable or limit the adoption of modernised theoretical models. Regulation of osteopathy was found to be a barrier when absent (Nesi et al., 2020). Other barriers included rigid educational curricula that may not be aligned with current evidence (Ménard et al., 2020), fear of losing professional identity (Alvarez et al., 2020), and transition from a Complementary and Alternative Medicine (CAM) to a healthcare profession (Steel et al., 2020).

All studies using the EBASE questionnaire among osteopaths (Alvarez et al., 2021; Cerritelli et al., 2021; Leach et al., 2019, 2020; Sundberg et al., 2018) reported that osteopaths' perceived lack of clinical evidence in osteopathy constitutes a barrier toward EBP uptake. In all these studies except one (Leach et al. 2020) osteopaths also reported the lack of time as a moderate to major barrier to EBP adoption. The ten EBP uptake facilitators mentioned in the EBASE questionnaire (Leach & Gillham, 2008) were rated as being either moderately or very useful by all participating osteopaths. These facilitators included improving access to full-text journal articles, the internet in the workplace, free online databases, online EBP education materials, critical reviews of research evidence relating to osteopathy, research rating tools, online tools that facilitate practitioner appraisal of the evidence, databases requiring licence fees, critically appraised topics relating to osteopathy, and critical appraisal tools.

Some studies have shown several issues with integrating EBP into osteopathic care and education. In a study exploring opinions on research and evidence-based medicine of UK osteopaths (Humpage, 2011), the author reported that one challenge to the adoption of EBP is the concern the research's findings could end up in conflict with or fall short of traditional osteopathic tenets. Additionally, Australian osteopaths' qualitative research revealed a perceived threat among practitioners that EBP may weaken the application of traditional osteopathic principles, which are thought to be distinctive to the discipline (Blaich et al., 2018). In the same way, qualitative study findings have also revealed conflicts between traditional osteopathic principles and EBP among UK osteopaths who teach (Kasiri-Martino & Bright, 2016). The authors cautioned against "strongly opinionated teachers" associated with "malleable students" because while some educators took care to offer a variety of viewpoints and fostered a critical attitude, some others promoted uncritical "acceptance of everything osteopathic". The influence of educators was also noticed by Figg-Latham & Rajendran (2017), who found that students' behaviour regarding following or disregarding clinical guidelines closely mirrored

that of educators. In this study, some teaching osteopaths perceived research threatening their professional identity. These beliefs may impede the implementation of evidence-based clinical guidelines for back pain in clinical practice (Inman & Thomson, 2019) but also with the learners at risk of perpetuating harmful beliefs toward the care of back pain sufferers (Mhadhbi et al., 2021). Another study conducted a survey of UK osteopaths examining their relationship with EBP (Weber & Rajendran, 2018). Although osteopaths had overall positive attitudes towards EBP, two-thirds of respondents did not use EBP in their practice. The study identified several factors that influence the use of EBP among UK osteopaths, including a lack of time, resources, and training, as well as a lack of confidence in their ability to critically appraise research.

Only a few therapeutically significant models in osteopathic care are supported by evidence, and promising research suggests the possible effectiveness of osteopathy for musculoskeletal disorders (Bagagiolo et al., 2022). Yet patients may not consistently receive evidence-based care. Moreover, it is not yet clear what the best ways to teach EBP in the healthcare context are. It remains a challenge for educators (Fineout-Overholt & Johnston, 2005).

2.4 Osteopathic education in France

Concerning the extent of professionalisation, legislation, and standards of education, osteopathy's definition, practice, and status as a profession vary around the globe (Osteopathic International Alliance, 2020). Two relatively similar leading international standards for osteopathic care exist: the CEN standard (CEN, 2015) and WHO benchmarks (World Health Organization, 2010). The WHO Benchmarks describe the fundamental concepts and principles of osteopathy, the evolution of osteopathic education, and the skills necessary for osteopathic practice. The CEN standard has been made public in 33 European nations as a foundation for valuable patient care, education, safety, and ethics for European osteopathic practice. Twelve European countries have achieved statutory regulation and licensing (European Federation & Forum for Osteopathy, 2021): Cyprus, Denmark, Finland, France, Iceland, Lichtenstein, Luxembourg, Malta, Norway, Portugal, Switzerland and the United Kingdom. Italy has regulated the status of osteopaths as an independent healthcare profession, but the regulation is still in process.

The French law decree No. 2014-1043 of September 12, 2014, established the legal framework for the education of osteopathy in France (Légifrance, 2014). According to this decree, individuals who wish to become osteopaths must complete a minimum of

4,860 hours of theoretical and practical training in osteopathy. This includes both academic coursework and clinical training. According to Article 75 of this law, "the professional use of the title of osteopath (...) is reserved for persons holding a diploma sanctioning specific training in osteopathy (...) issued by an establishment of training approved by the minister responsible for health under conditions set by decree." Decrees dated 2007 and 2014 regulate practice (Légifrance, 2007) and education (Légifrance, 2014). Osteopathy is defined by the health minister as "an osteopath uses a systemic approach, and, after having realized an osteopathic diagnosis, realizes mobilizations and manipulations to fix osteopathic dysfunctions of the human body." More than 30,000 osteopaths are currently registered in France: among them, 22,000 'only' osteopaths, 10,000 physiotherapists/osteopaths, 1,500 physicians/osteopaths. To become an osteopath in France, a student must complete a five-year course open to students with a High School Graduation. The course is divided into seven categories: 1. Fundamental sciences, 2. Semiology of alterations of health condition, 3. Humanities, social sciences, management, and law, 4. Foundations and concepts of osteopathy, 5. Osteopathic practice, 6. Methodology and Working Tools, and 7. Development of the osteopath's competencies. The curriculum is balanced between theory and practice, with 40% Magistral Courses and 60% Practical Work. The student needs to achieve 4,860 hours of training in osteopathy to become an osteopath with 1,500 hours of clinical practice, 150 supervised consultations and must write a thesis. The diploma is issued by the French ministry of Education and the French ministry of Employment and corresponds to level “RNCP1”, the highest award according to national standards.

Educators are expected to have a deep understanding of osteopathic principles, techniques, and clinical applications, which is gained through practical experience in treating patients. In this sense, the 2014 law requires osteopaths wishing to teach to have five years of experience. That article in the 2014 law is the only requirement besides of course having a diploma in osteopathy. There is no legal obligation, for example, to participate in research activities, continuous professional development, or specific training in the field of student supervision. This situation makes the hiring process somewhat difficult for OEIs as there is no standard to which to relate.

3 Purpose, aims & research objectives

As previously stated, osteopaths who teach osteopathy in OEIs have some diverse backgrounds. It is unclear which attitude they adopt toward EBP and how they use it. The purpose is to improve educator qualification and osteopathic education. The aim is

to explore the attitudes, skills, and use of EBP among French osteopaths who teach in two OEIs.

The study is led by the following research questions:

- What are French osteopaths' attitudes, skills, and use of EBP in two OEIs?
- What are the barriers and enablers of French osteopaths who teach for adopting EBP?
- What is the association between the characteristics (e.g., demographics, education background) of teaching osteopaths and their attitudes, skills and use of EBP?

4 Methods

4.1 Study design and setting

This thesis was conducted as a part of a master's degree in health care containing a programme in osteopathy offered by the Metropolia University of Applied Sciences, Finland. This cross-sectional survey was conducted in two French OEIs, the Institut d'Ostéopathie de Rennes-Bretagne (IO-RB), France and the Centre Européen d'Enseignement Supérieur de l'Ostéopathie (CEESO), France.

The IO-RB is on the Ker Lann campus in Bruz, Brittany, France. The CEESO is in Saint-Denis, the Paris suburbs. Both OEIs are post-baccalaureate osteopathy training institutes that train students to become osteopaths in 5 years. The courses consist of 4860 hours of training spread over five years. The clinical training consists of 1500 hours. The clinical training programme combines classroom teaching with clinical internships in the institute's own clinic and partner training institutions. The clinical programme is divided into three phases: Year 1 and Year 2 (120 hours) correspond to the observation and discovery of osteopathy with professionals in private practice; Year 3 (210 hours) and Year 4 (450 hours) include progressive learning of the different steps of consultation; and Year 5 (720 hours) involves the self-management of a minimum of 150 full consultations. In the last years of training, specific research methodologies, skills, and statistics are taught to include EBP in the curriculum. The lectures mainly focus on the thesis writing process. Only some classes address EBP apart from the thesis courses. Both OEIs have around 350 students spread over five years of training. These two institutions have a pedagogical clinic where students gradually undergo osteopathic consultations in their third, fourth and fifth years of study.

4.2 Participants

The electronic survey was first addressed to the group of osteopaths who teach in the IO-RB. There are 102 educators in the IO-RB (total sample), from whom 74 are osteopaths who teach. The teaching time between osteopaths in IO-RB varies considerably and ranges between 16 and 750 hours. Some of them only give lectures (N=24), some of them only supervise students as clinical tutors (N=35), while some do both lectures and supervision (N=15). Due to the low number of responses, it was decided to include another OEI, the CEESO, to increase the number of participants by using the same inclusion and non-inclusion criteria. The osteopathy educator's population is 60 at the CEESO. The inclusion criteria were the completion of the diploma in osteopathy according to the French regulation of osteopathy. Indeed, some other healthcare providers also give lectures in the IORB (N=28), such as psychologists, medical doctors, or English professors.

The sample size required to achieve a 50% response distribution, 10% margin of error and 95% confidence interval for any individual item in the survey was 57. This was based on a target population of 134 teaching osteopaths (74 from the IO-RB and 60 from the CEESO).

4.3 Data collection

Teaching osteopaths were invited to participate in the survey through emails sent by the research department of both OEIs. Data were gathered via an online survey using E-Lomake software. The link to the electronic survey for the IO-RB participants was emailed in June 2022, with a response deadline of two weeks. Then a first reminder was sent two weeks after. The 15th of June corresponded to the day of the thesis defence for osteopathy students, which brought together nearly 50 osteopathic teachers on the same day. This provided an opportunity for a short oral presentation of the study (5 minutes) and its purposes and to invite people to respond to the questionnaire when they received the link by email. Finally, an email was sent two weeks after the definitive deadline to increase the response rate and reach educators who didn't respond to the last reminder.

The link to the electronic survey for the CEESO participants was emailed on 2 September 2022, with a response deadline of two weeks. Then a first reminder was sent two weeks after (16 September). Finally, an email was sent two weeks after the definitive

deadline to increase the response rate and reach educators who didn't respond to the last reminder. The survey was therefore closed, and the data was collected on 30 September.

4.4 Description of survey and variables

The EBASE questionnaire (Leach & Gillham, 2008) is an 80-item questionnaire designed to assess attitudes, skills, and use of EBP among healthcare professionals. The survey comprises seven constructs: attitude (10 items, rated using a 5-point scale, ranging from "Strongly Agree" to "Strongly Disagree"), skills (13 items, rated using a 5-point scale, ranging from "Low" to "High"), education and training (5 multiple-choice items), use (9 items, rated based on the number of times performing specific EBP-related activities), barriers, enablers (23 items, rated using a 4-point scale, ranging from "no barrier / not useful" to "major barrier / very useful"), and socio-demographics (13 multiple-choice items and an open-label question).

The original EBASE questionnaire shows acceptable test-retest reliability (ICC = 0.578–0.986), good internal consistency (Cronbach's alpha = 0.84), and good construct and content validity (CVI = 0.899) (Leach & Gillham, 2008). Moreover, the questionnaire has been delivered to several groups of healthcare providers and complementary and alternative practices from various countries (Albisser et al., 2022; Bussières et al., 2015; Leach & Gillham, 2011; Schneider et al., 2015; Snow et al., 2017; Sullivan et al., 2017; Sundberg et al., 2023).

The attitude, skills, and use items can be regrouped to create subscores. The "attitude" subscore is made by the sum of the 8 first items, with scores ranging from 8 (predominantly strongly disagree) to 40 (predominantly strongly agree). The "skills" subscore consists of the sum of all 13 items, with scores ranging from 13 (low-level skill) to 65 (high-level skill). Finally, the "use" subscore is the sum of the first 6 items, with scores ranging between 0 (mostly infrequent use) and 24 (mainly frequent use).

4.5 Translation and cultural adaptation

The EBASE questionnaire was created for Australian complementary and alternative medicine practitioners (Leach & Gillham, 2008). Thus, several items had to be changed to ensure that they could be replicated for the French osteopathy population, as it has been done in previous EBASE research. For example, demographic items in part G of

the questionnaire were changed to be geographically relevant, or the previous studies undergone by participants were adapted to the French educational grading system. The term “CAM” (complementary and alternative medicine) was also replaced with “osteopathy” throughout the questionnaire.

The questionnaire was translated according to established guidelines' forward and backward translation methodology (Beaton et al., 2000). It is a standard method of evaluating the comprehension of a source text and tracing any inconsistencies or ambiguities that need to be fixed or otherwise considered when finishing the source text. First, the author proceeded by doing a forward translation from English to French. The master thesis candidate’s aunt, a doctor in linguistics, did the back-translation of the questionnaire from French to English. Finally, the author and its 2nd supervisor (in the IO-RB) compared both English versions. Equivalence between versions was found to be good enough, showing very few differences with no meaning alteration.

4.6 Pilot testing

To determine the validity and comprehension of the translation, a pilot was sent out to three osteopaths who teach and to students in their final year who were on a mailing list about research. They received an email on May 26th, 2022, with the link to the online survey with a 7-day response deadline. Two students responded to the pilot study. They were asked to measure how long it took to complete the survey and to note if questions were ambiguous or not fully understood. It took between 10 and 15 minutes to complete the survey. Some minor changes were made considering participant feedback, and misspellings were corrected.

4.7 Ethics

This study was conducted according to the European Code of Conduct for Research Integrity (ALLEA - All European Academies, 2017). Participation in the study was completely voluntary and anonymous. The first page of the online survey contained a participant information letter. This letter explained the setting, the purpose of the study, the time it should take to complete the survey, the guaranteed anonymity of the obtained data, and that there are no risks or compensation involved with participation in this study to the participants. Furthermore, the participants were provided with the author's personal contact information, allowing them to access any information and/or withdraw their involvement at any moment. Participants needed to tick a box at the bottom of the

page indicating that they had read the prior statements and accepted to participate in the study. No personal data was acquired during the study, and no question could link a participant to the responses he or she made. E-lomake (by Eduix Ltd.) was the online software used for this study. The software editor guarantees General Data Protection Regulation (GDPR) compliance in their professional hosting data protection statements. The author was granted access to the E-lomake account by the Metropolia University of Applied Sciences, Helsinki, Finland, on the condition that the linked server be set up following GDPR guidelines. Finally, all collected data was secured on the author's personal computer and was fingerprint and password protected.

4.8 Statistical analysis

Survey data were imported to IBM SPSS Statistics ® (version 29.0) for coding and statistical analysis. There was no missing data, as all answers were set as mandatory in the questionnaire. Categorical data were described using frequency distributions and percentages. The numerical data were processed as non-parametric data using the medians (location) and the interquartile range (dispersion). The internal consistency of the subscores was measured using Cronbach's alpha. Associations between ordinal-level variables (e.g. age, years of practice and teaching) were examined using Kendall's Tau correlation coefficient (T). The relationships between nominal-level variables (e.g., gender, localisation of practice) were assessed using Cramer's V. Associations were interpreted as weak (0.10–0.29), moderate (0.30–0.49) or strong (>0.50). The level of significance was set at $p < 0.05$.

5 Results

The survey was sent to 134 osteopaths (74 from the IO-RB and 60 from the CEESO), out of which 60 responded (response rate of 45 %).

5.1 Sample characteristics

Most participants were male (n= 42, 70%), aged between 30 and 59 years (n = 53, 88.3%), with two-thirds of them being between 30 to 39 years. Three-quarters of them do not belong to any professional association. Two-thirds of the participants held no other degree than osteopathy degree qualification, one quarter held a master's degree qualification in another field than osteopathy, and only one held a doctoral degree qualification. Three-quarters of the participants had practised osteopathy between 6 and 15

years, mainly in private practice and with conventional and allied health providers (Table 2).

Table 2. Characteristics of participants

Characteristic	Frequency, n (%)
Age	
18-20 years	0 (0)
20-29 years	5 (8.3)
30-39 years	40 (66.7)
40-49 years	9 (15)
50-59 years	4 (6.7)
60-69 years	1 (1.7)
70+ years	1 (1.7)
Sex	
Female	18 (30)
Male	42 (70)
Highest qualification	
Diploma in osteopathy	40 (66.7)
Master	15 (25)
PhD	1 (1.7)
Years since receiving highest qualification	
<1 year	3 (5)
1–5 years	12 (20)
6-10 years	25 (41.7)
11-15 years	15 (25)
16+ years	4 (6.7)
Years practiced in the field of osteopathy	
<1 year	0 (0)
1–5 years	5 (8.3)
6-10 years	20 (33.3)
11-15 years	25 (41.7)
16+ years	10 (16.7)
Years practiced in teaching osteopathy	
<1 year	4 (6.7)
1–5 years	24 (40)
6-10 years	14 (23.3)
11-15 years	12 (20)
16+ years	6 (10)
Osteopathy professional association membership	
No	45 (75)
Yes	15 (25)

Table 2. (*continued*)

Hours per week in (clinical) osteopathic practice	
0 h	1 (1.7)
1-5 h	0 (0)
6-10 h	3 (5)
11-15 h	1 (1.7)
16-20 h	6 (10)
21-25 h	7 (11.7)
26-30 h	17 (28.3)
31-35 h	8 (13.3)
36-40 h	12 (20)
41-45 h	1 (1.7)
46-50 h	2 (3.3)
50+ h	1 (1.7)
Hours per week participating in research	
0 h	19 (31.7)
1-5 h	33 (55)
6-10 h	4 (6.7)
11-15 h	2 (3.3)
16-50+ h	2 (3,3)
Hours per week working in the higher education sector	
0 h	0 (0)
1-5 h	22 (36.7)
6-10 h	19 (31.7)
11-15 h	12 (20)
16-20 h	4 (6.7)
21-25 h	2 (3.3)
26-30 h	1 (1.7)
31-50+ h	0 (0)
Clinical setting in which osteopathy was predominantly practiced	
Solo practice	27 (45)
With conventional and allied health providers	19 (31.7)
With a mix of complementary and allied health providers	9 (15)
With a group of complementary health providers	5 (8.3)
Within an educational institution	1 (1.7)
Experience of publishing in a peer-reviewed journal	
No	49 (81.7)
Yes	11 (18.3)

Half of the participants were from the Brittany region (Bretagne), and a third were from the Paris region (Ile-de-France). (Figure 1).

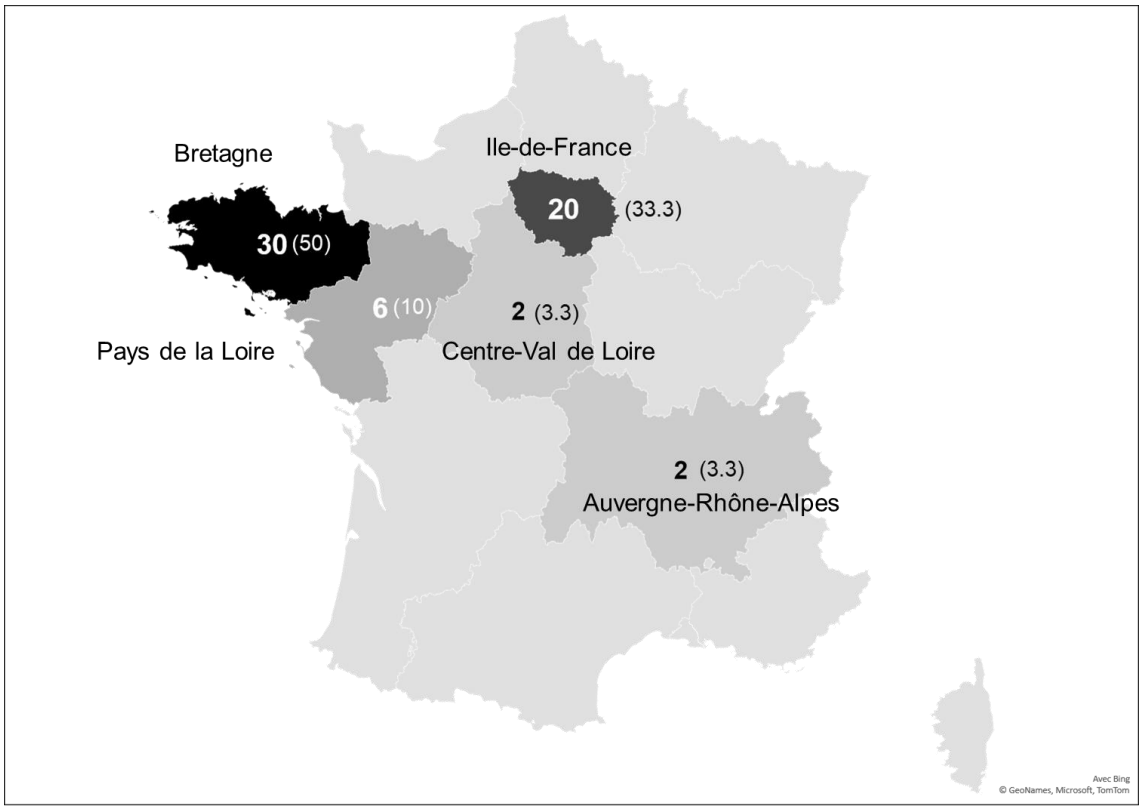

Figure 1. Geographical respondents' region of practice, number (percentage).

5.2 Attitudes toward EBP

Participants had a generally positive attitude toward EBP (median attitude subscale score 30.5, IQR 28, 36; range 14–40; scores ranging between 24.1 and 32.0 are indicative of a moderate to moderate-high attitude level). Most of them agreed that EBP assists in making decisions about patient care (80%), that professional literature and research findings are useful in day-to-day practice (78.4%) and that EBP is necessary for osteopathic practice (88%) (Table 3). The attitude items in EBASE-Fr demonstrated good internal consistency (raw Cronbach's alpha = 0.736; standardised Cronbach's alpha = 0.734). There was a strong positive association between the attitude sub score and having previously published research work in a peer-reviewed journal ($V = 0.791$, $p < 0.05$). A strong positive association was also found between the attitude sub score and the clinical setting in which osteopathy was predominantly practised ($V = 0.743$, $p < 0.05$). There was a weak positive association between attitude towards EBP and hours dedicated per week to teaching ($T=0.280$, $p<0.05$) and a weak negative association with years of teaching ($T = -0.203$, $p < 0.05$).

Table 3 – Participant's attitudes toward EBP (IQR - Interquartile Range; main response in bold)

	1 Strongly Disagree n (%)	2 Disagree n (%)	3 Neutral n (%)	4 Agree n (%)	5 Strongly Agree n (%)	Median (IQR)
EBP is necessary in the practice of osteopathy	1 (1.7)	8 (13.3)	6 (10)	**25 (41.7)**	16 (26.7)	4 (1.25)
EBP improves the quality of my patient's care	3 (5)	5 (8.3)	13 (21.7)	**22 (36.7)**	17 (28.3)	4 (1)
EBP assists me in making decisions about patient care	1 (1.7)	5 (8.3)	4 (6.7)	**25 (41.7)**	23 (38.3)	4 (2)
I am interested in learning or improving the skills necessary to incorporate EBP into my practice	0 (0)	2 (3.3)	2 (3.3)	**27 (45)**	24 (40)	4 (1)
Professional literature (i.e. journals & textbooks) and research findings are useful in my day-to-day practice	2 (3.3)	4 (6.7)	5 (8.3)	**28 (46.7)**	19 (31.7)	4 (1)
Prioritizing EBP within osteopathic practice is fundamental to the advancement of the profession	2 (3.3)	13 (21.7)	8 (13.3)	**21 (35)**	14 (23.3)	4 (1.5)
EBP takes into account my clinical experience when making clinical decisions	1 1.7)	5 (8.3)	7 (11.7)	**23 (38.3)**	20 (33.3)	4 (1)
EBP takes into account a patient's preference for treatment	4 (6.7)	15 (25)	9 (15)	**16 (26.7)**	15 (25)	4 (3)
There is a lack of evidence from clinical trials to support most of the treatments I use in my practice	2 (3.3)	10 (16.7)	12 (20)	**23 (38.3)**	7 (11.7)	4 (1)
The adoption of EBP places an unreasonable demand on my practice	12 (20)	**35 (58.3)**	7 (11.7)	3 (5)	2 (3.3)	2 (0)

5.3 Skills in EBP

Respondents reported being moderately to moderately-highly skilled in EBP, with a median skills subscore of 40 (IQR 34,47; range 21–65; scores ranging between 39.1 and 52.0 are indicative of a moderate to moderate-high skill level). They reported being highly skilful in identifying knowledge gaps in practice, considering answerable clinical questions, locating professional literature, and sharing evidence with colleagues (Table 4). They felt that their skills were lowest in the conduct of clinical research, systematic reviews, and using findings from clinical research. Internal consistency across all EBASE skills items was good (raw Cronbach's alpha = 0.908; standardised Cronbach's alpha = 0.909). There was a strong positive association between skills subscore and having previously published research work in a peer-reviewed journal ($V = 0.933$, $p < 0.05$). A weak positive association was found between skill subscore, and weekly hours dedicated to research ($T = 0.245$, $p < 0.05$). There was also association between answers to the item "EBP takes into account patient's preferences for treatment" from the attitude part of the questionnaire and self-reported skill level subscores. Participants' Likert score to that item was weakly positively associated with the skill subscore ($T = 0.261$; $p < 0.01$). Associations are summarised in Figure 2.

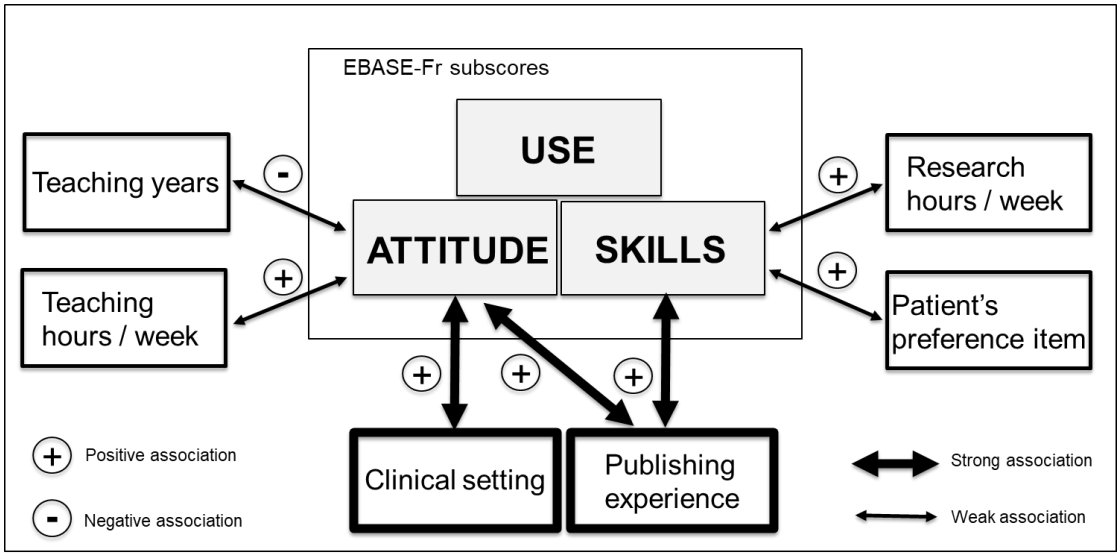

Figure 2. Associations between attitude and skills subscores and participants' characteristics .

Table 4 – Participants' reported skills toward EBP (IQR - Interquartile Range; main response in bold)

	1 Low n (%)	2 Moderate-low n (%)	3 Moderate n (%)	4 Moderate-high n (%)	5 High n(%)	Median (IQR)
Identifying knowledge gaps in practice	3 (5)	7 (11.7)	18 (30)	**30 (50)**	2 (3.3)	4 (1)
Identifying answerable clinical questions	2 (3.3)	8 (13.3)	15 (25)	**32 (53.3)**	3 (5)	4 (1)
Locating professional literature	1 (1.7)	11 (18.3)	14 (23.3)	**25 (41.7)**	9 (15)	4 (1)
Online database searching	4 (6.7)	9 (15)	**20 (33.3)**	17 (28.3)	10 (16.7)	3 (1)
Retrieving evidence	6 (10)	9 (15)	**24 (40)**	18 (30)	3 (5)	3 (1.3)
Critical appraisal of evidence	5 (8.3)	7 (11.7)	**28 (46.7)**	17 (28.3)	3 (5)	3 (1)
Synthesis of research evidence	2 (3.3)	10 (16.7)	**24 (40)**	20 (33.3)	4 (6.7)	3 (1)
Applying research evidence to patient cases	4 (6.7)	8 (13.3)	**23 (38.3)**	19 (31.7)	6 (10)	3 (1)
Sharing evidence with colleagues	2 (3.3)	9 (15)	19 (31.7)	**25 (41.7)**	5 (8.3)	3,5 (1)
Conducting clinical research	11 (18.3)	**19 (31.7)**	14 (23.3)	10 (16.7)	6 (10)	2,5 (2)
Using findings from systematic reviews	0 (0)	10 (16.7)	**25 (41.7)**	21 (35)	4 (6.7)	3 (1)
Conducting systematic reviews	**21 (35)**	18 (30)	10 (16.7)	7 (11.7)	4 (6.7)	2 (2)
Using findings from clinical research	5 (8.3)	**16 (26.7)**	24 (40)	11 (18.3)	4 (6.7)	3 (1.3)

5.4 Use of EBP

Participants reported having been engaged in EBP activities at a low level in the 30 days preceding study enrolment, with findings revealing a median use sub-score of 7 (IQR 4,12.5; range 0–18), reflecting a level of EBP utilisation predominantly in the range of 1–10 times per month (as indicated by scores ranging between 6.1 and 12.0). More than 40% of the participants had read professional literature or research findings relevant to their practice at least once in the preceding month (Table 5). Nearly half of the participants consulted a colleague to assist their clinical decision-making 1-to-5 times during the previous month, and 30 % used an online search engine with the same frequency. Over a third of the participants did not use any online database to search for practice-related literature or research during the last month. The internal consistency of EBP use items was found to be good (raw Cronbach's alpha = 0.896; standardised Cronbach's alpha = 0.894). No significant association was found between any variable and the use subscore.

Table 5 - Participants' use of evidence-based practice within the last month (IQR - Interquartile Range; main response in grey)

	0 0 times n (%)	1 1-5 times n (%)	2 6-10 times n (%)	3 11-15 times n (%)	4 16+ tmes n (%)	Median (IQR)
I have read/reviewed professional literature (i.e. professional journals & textbooks) related to my practice	4 (6.7)	**30 (50)**	8 (13.3)	17 (28.3)	0 (0)	1 (2)
I have read/reviewed clinical research findings related to my practice	10 (16.7)	**26 (43.3)**	9 (15)	14 (23.3)	0 (0)	1 (1)
I have used professional literature or research findings to assist my clinical decision-making	18 (30)	**26 (43.3)**	9 (15)	6 (10)	0 (0)	1 (1.5)
I have used professional literature or research findings to change my clinical practice	15 (25)	**24 (40)**	10 (16.7)	10 (16.7)	0 (0)	1 (1.5)
I have used an online database to search for practice related literature or research	**21 (35)**	18 (30)	8 (13.3)	12 (20)	0 (0)	1 (2)
I have used an online search engine to search for practice related literature or research	11 (18.3)	17 (28.3)	13 (21.7)	**18 (30)**	0 (0)	2 (2)
I have consulted a colleague or industry expert to assist my clinical decision-making	16 (26.7)	**28 (46.7)**	7 (11.7)	8 (13.3)	0 (0)	1 (1.5)
I have referred to magazines, layperson / self-help books, or non-government/non-education institution websites to assist my clinical decision-making	**27 (45)**	23 (38.3)	4 (6.7)	5 (8.3)	0 (0)	1 (1)

5.5 Training in EBP

Most participants reported some level of training in evidence-based practice/osteopathy (88.3%), evidence application (78.3%), critical thinking/analysis (71.7%), and conducting clinical research (56.7%). Nearly half of the respondents indicated they had received education during their undergraduate training programme in evidence-based practice (43.4% of respondents). This number is close to one-third for clinical practice (28.4%), critical thinking/analysis (29.9%) and the conduct of clinical research (31.4%). Nearly two-thirds of respondents had undertaken no training in conducting systematic reviews or meta-analyses (61.7%) (Table 6).

Table 6 – Reported training in EBP (main response in bold)

	None	Seminar (less than 1 day)	Short course (less than 1 week)	Specific course (1 week or longer)	Certificate	Diploma	Minor component of a study program	Major component of a study program	Other
Evidence-based practice / evidence-based osteopathy	7 (11.7)	13 (21.7)	**23 (38.3)**	14 (23.3)	1 (1.7)	13 (21.7)	7 (11.7)	6 (10)	4 (6.7)
Applying research evidence to clinical practice	13 (21.7)	15 (25)	**18 (30)**	7 (11.7)	0 (0)	9 (15)	6 (10)	5 (8.3)	0 (0)
Conducting clinical research (i.e. clinical trials)	**26 (43.3)**	8 (13.3)	9 (15)	4 (6.7)	0 (0)	7 (11.7)	6 (10)	4 (6.7)	2 (3.3)
Conducting systematic reviews or meta-analysis (i.e. statistical analysis of data combined from two or more studies)	**37 (61.7)**	7 (11.7)	5 (8.3)	5 (8.3)	0 (0)	2 (3.3)	4 (6.7)	2 (3.3)	1 (1.7)
Critical thinking / critical analysis	**17 (28.3)**	13 (21.7)	14 (23.3)	8 (13.3)	1 (1.7)	8 (13.3)	5 (8.3)	5 (8.3)	2 (3.3)

5.6 Sources of information used to inform clinical decision-making

Personal intuition, textbooks and patient preference were reported as the most frequently used sources of information to inform clinical practice. In contrast, clinical practice guidelines were reported as the less frequently used (Table 7).

Table 7. Sources of information used to inform clinical decision-making (sources were ranked from 1 = most frequently used to 10 = least frequently used).

Information source	Median (IQR)
Traditional knowledge	5 (6)
Clinical practice guidelines	9 (3)
Personal intuition	4 (5)
Consulting fellow practitioners or experts	6 (4)
Patient preference	4 (5)
Personal preference	5 (4)
Published clinical evidence (i.e. clinical trials)	5 (4.75)
Textbooks	4 (4.75)
Trial and error	5 (5.75)
Published experimental/laboratory evidence	5 (4.75)

5.7 Barriers toward EBP

The only factors perceived by most participants as being moderate barriers to EBP uptake were a lack of time, a lack of clinical evidence in osteopathy, insufficient skills for interpreting research, and a lack of colleagues and industry support for EBP. Most participants perceived other factors as minor or no barriers to EBP uptake (Table 8).

Table 8 – Barriers toward EBP (IQR - Interquartile Range; main response in bold)

	Not a barrier n (%)	A minor barrier n (%)	A moderate barrier n (%)	A major barrier n (%)
Lack of time	4 (6.7)	17 (28.3)	**23 (38.3)**	16 (26.7)
Lack of clinical evidence in osteopathy	7 (11.7)	16 (26.7)	**20 (33.3)**	17 (28.3)
Insufficient skills for locating research	16 (26.7)	**23 (38.3)**	19 (31.7)	2 (3.3)
Insufficient skills for interpreting research	12 (20)	19 (31.7)	**23 (38.3)**	6 (10)
Insufficient skills to critically appraise / evaluate the literature	13 (21.7)	**22 (36.7)**	19 (31.7)	6 (10)
Insufficient skills to apply research findings to clinical practice	14 (23.3)	**23 (38.3)**	19 (31.7)	4 (6.7)
Lack of incentive to participate in evidence-based practice	**19 (31.7)**	18 (30)	18 (30)	5 (8.3)
Lack of interest in evidence-based practice	**24 (40)**	22 (36.7)	9 (15)	5 (8.3)
Lack of relevance to osteopathy practice	**23 (38.3)**	16 (26.7)	10 (16.7)	11 (18.3)
Lack of colleague support for evidence-based practice	16 (26.7)	18 (30)	**20 (33.3)**	6 (10)
Lack of industry support for evidence-based practice	7 (11.7)	13 (21.7)	**26 (43.3)**	14 (23.3)
Patient preference for treatment	**27 (45)**	20 (33.3)	9 (15)	4 (6.7)

5.8 Enablers toward EBP

Nine factors out of ten were considered very useful enablers of EBP implementation (Table 9). The only factor perceived as moderately useful was ‘access to tools to assist the evaluation of research evidence’.

Table 9 – Enablers toward EBP (IQR - Interquartile Range; main response in grey)

	Not useful n (%)	Slightly useful n (%)	Moderately useful n (%)	Very useful n (%)
Access to the Internet in your workplace	3 (5)	6 (10)	14 (23.3)	**37 (61.7)**
Access to free online databases in the workplace, such as Cochrane and PubMed	3 (5)	8 (13.3)	16 (26.7)	**33 (55)**
Free access to online databases that usually require license fees, such as MEDLINE and CINAHL	4 (6.7)	4 (6.7)	19 (31.7)	**33 (55)**
Ability to download full-text / full-length journal articles	2 (3.3)	6 (10)	12 (20)	**40 (66.7)**
Access to online education materials related to evidence based practice	1 (1.7)	5 (8.3)	19 (31.7)	**35 (58.3)**
Access to tools used to assist the critical appraisal / evaluation of research evidence	2 (3.3)	7 (11.7)	**27 (45)**	24 (40)
Access to critically appraised topics relevant to osteopathy (these are critical appraisals of single research papers)	1 (1.7)	4 (6.7)	25 (41.7)	**30 (50)**
Access to critical reviews of research evidence relevant to osteopathy	1 (1.7)	4 (6.7)	23 (38.3)	**32 (53.3)**
Access to research rating tools that facilitate critical appraisal of single research papers	2 (3.3)	8 (13.3)	24 (40)	**26 (43.3)**
Access to online tools that assist you to conduct your own critical appraisals of multiple research papers related to a single topic	3 (5)	12 (20)	20 (33.3)	**25 (41.7)**

6 Discussion

6.1 Sample characteristics

The response rate for the study was 45%. This number is consistent with previous research on osteopathy educators. Mhadhbi (2021) achieved a 48% rate in a previous study. The response rate reached the required sample size (which was estimated at 58) and was significantly higher than that reported in previous EBP studies on osteopathic professionals in Australia (Leach et al., 2019) and in the UK (Sundberg et al., 2018). Although this number seems satisfactory, it is not entirely clear if it represents the views of all educators in the two OEIs studied. Indeed, it is possible that the one most resistant to EBP did not take the time to respond to the questionnaire and even more so due to the relatively long time it takes to answer the EBASE questionnaire (10-15 minutes).

The number of institutes accredited to deliver the osteopathic diploma in France is 31. By estimating an average of 50 osteopaths teaching per institute, this gives us a figure of approximately 1550 osteopaths teaching in France. Therefore, no generalizable findings can be set out in this study, as the external validity is low (the sample represents

about 4% of French osteopathy educators). However, in terms of gender, age, years of experience teaching, and years of osteopathy practice, the demographic features of our sample were comparable to those of previous studies on French osteopathy educators (Mhadhbi et al., 2021, 2023).

6.2 EBP attitudes

In line with earlier research involving professional osteopaths (Alvarez et al., 2021; Cerritelli et al., 2021; Leach et al., 2019, 2020; Sundberg et al., 2018), participating teaching osteopaths expressed predominantly positive attitudes toward EBP, as indicated by their responses. In our study, most participants (68.4%) felt EBP was necessary for osteopathic practice. However, the level of agreement regarding the role of EBP in practice, as observed in our study, is comparatively lower than the findings reported among Swedish osteopaths (80.8%), Australian osteopaths (84.6%), UK osteopaths (76.5%), Spanish osteopaths (89.6%), and Italian osteopaths (88.2%). Promisingly, most osteopaths participating in our study (85%) demonstrated a keen interest in acquiring the essential skills needed to effectively implement EBP. Approximately one out of two teaching osteopaths disagreed or strongly disagreed with the idea that EBP considers the patient's own preferences and choices. This result suggests that either participating osteopaths' comprehension of EBP may be limited or that teaching osteopaths' understanding of the significance of patient preference within EBP may be lacking. The possible lack of understanding of what EBP includes is reinforced by the fact that participants reported using patient preferences as the most frequently used source of information to guide their clinical decision-making. While the respondents have positive opinions of EBP, it is possible that they underestimated their knowledge and skills in this field and that they were unaware of all its facets. To add to the discussion, we found a positive association between answers to the item related to patients' preferences for treatment and self-reported skill level subscores. Participants who expressed that EBP does not consider patient preferences had lower reported skill level subscores. Although further research is needed, it may indicate that some osteopaths who teach (nearly half of our sample) did not fully apprehend the definition of EBP in association with poorer skill levels toward EBP.

Osteopathy-related educational development and research in the French context could greatly benefit from improved communication of patient values and preferences, in addition to other fundamental elements of EBP, as EBP may solely be seen in terms of the use of evidence for clinical decision-making by osteopaths who teach. In addition to

the earlier mentioned results, nearly three-quarters of participants agreed or strongly agreed that EBP adequately takes into account clinical expertise when making clinical decisions. A strong positive association was found between osteopaths' attitudes toward EBP and their clinical setting, as osteopaths working with other healthcare providers showed better attitudes toward EBP than those who worked alone or with CAM practitioners. This multidisciplinary collaboration could generate a setting that encourages the sharing of information and concepts related to EBP. Working with experts from other fields could allow osteopaths to experience different EBP strategies and see how research evidence is applied in practice (Zwarenstein et al., 2009). This exposure may improve their comprehension of the importance and utility of EBP in healthcare decision-making. Additionally, interprofessional cooperation offers chances for peer learning, mentoring, and group decision-making, all of which can help to create a culture that supports the adoption and use of EBP (Koffel & Reidt, 2015). Through this understanding, professional silos may be lessened, and a common dedication to EBP across disciplines can be reinforced. (Morin et al., 2018).

6.3 EBP skills

Participants indicated moderate to moderate-high levels of perceived skills in EBP; the items associated with problem identification and acquiring evidence receiving the highest reported levels. Thus, teaching osteopaths considered themselves to possess satisfactory proficiency in the initial two steps of the EBP process as defined by Sackett (2000): converting the information requirement into a clinical question that may be addressed and looking for the best available evidence. The results also suggest that French osteopaths who teach possess a moderate level of skills regarding the critical appraisal, synthesis, and application of evidence to clinical practice, representing the final three steps of the EBP process. This is consistent with the perceived barriers to EBP adoption that participants indicated, of which half of the respondents regarded a lack of research interpretation skills as a barrier to EBP use. As a result, faculty development could consider improving critical appraisal and application steps among educators. Indeed, regardless of the clinicians' past educational training, previous research among nurses demonstrated that EBP attitudes and skills may be increased and sustained by taking intensive EBP immersion courses (Gallagher-Ford et al., 2020). The lowest reported skills relating to EBP involved conducting clinical research and systematic reviews. It coincides with teaching osteopaths' reported training background, with more than half of respondents declaring having undergone no training at all related to these two EBP activities. While carrying out research is not mandatory for osteopaths

who teach, it is reasonable to expect that they can find and use information from systematic reviews and evidence-based clinical recommendations in their daily practice and for their lectures. Those results are similar to those of other studies on practicing osteopaths (Leach et al., 2020; Sundberg et al., 2018). An interesting strong positive association was found in our study between having published in a peer-reviewed journal and attitudes and skills subscores. Although correlation is different from causation, one may think that faculty development programs that foster collaborative research between educators could lead to usefully enhancing their knowledge and competencies in EBP. This seems even more promising as almost half of the respondents reported a moderately-high ability to share evidence with colleagues and documented as a moderate to a major barrier the lack of colleague support for implementing EBP. Paradoxically, three-quarters of the osteopaths declared not belonging to any professional association. Future research could assess the barriers to such professional and/or academic participation.

6.4 EBP use, barriers, and enablers

Regardless of a positive view of EBP and a moderately-high level of reported skills in EBP, respondents declared to have a low utilisation of EBP (they participated in EBP activities in the range of 1–10 times/month For example, more than a third of participants did not use any online data for practice-related literature over the last month. The relatively modest level of involvement in EBP-related activities can be attributed to various factors. Participants perceived their insufficient skills for interpreting research as a moderate to a major barrier to EBP uptake. This conflicts with their moderate-high perceived skills in EBP. Either participants reported an overestimation of their skills in EBP, or they underestimated their ability to interpret research results. Qualitative studies interviewing osteopaths who teach could lead to a better understanding of the phenomena of perceived barriers and EBP uptake in the French osteopathic educational context. As in all previous studies using the EBASE on osteopaths (Alvarez et al., 2021; Cerritelli et al., 2021; Leach et al., 2019, 2020; Sundberg et al., 2018), the lack of time was perceived as a barrier engaging in EBP activities.

As in previous research, the lack of clinical evidence was reported as a moderate to major barrier to EBP uptake (Alvarez et al., 2021; Leach et al., 2019, 2020; Sundberg et al., 2018). Undeniably, there is very little clinical research specifically focused on osteopathy and gives clinical guidelines for conditions that osteopaths address (Licciar-

done, 2007). Furthermore, despite the slow accumulating clinical evidence for osteopathic manipulative treatment, it frequently lacks methodological rigour (DiSabato, 2023). Nonetheless, a significant amount of research in musculoskeletal and manual therapy fields may be used to guide osteopathy practice (Steel et al., 2017). It is, therefore, possible that a misunderstanding of the nature and activities of EBP led to the perception of a "lack of clinical evidence" being mentioned as a barrier to EBP uptake. The respondents' perceived “lack of clinical evidence” might also relate to the moderately low-level reported skills in using clinical research findings.

Like previous studies, French osteopaths reported traditional knowledge, personal intuition, textbooks, and patient preferences as the most frequently used sources of information to inform clinical decision-making. While UK (Sundberg et al., 2018) and Australian (Leach et al., 2019) osteopaths reported clinical guidelines as their second most frequently used information source, French educators reported guidelines as the less used. Considering the findings from Figg-Latham & Rajendran (2017) and Inman & Thomson (2019), this subject merits more study and special attention. These studies revealed an association between students' adherence to clinical guidelines and the attitude demonstrated by their teachers. A significant translational gap between research and practice may be evident since clinical recommendations often represent the best available evidence on a subject (Feder et al., 1999). These results also suggest that EBP application to clinical practice may depend on factors other than just competencies, as respondents reported moderate-high skill level. This can also suggest that respondent overestimated their skill level. Cognitive bias may affect perceptions of skill level, especially in people with little knowledge and competence. This can lead to an overestimation of such abilities and proficiency known as the Dunning-Kruger effect (Dunning, 2011). A research study designed to measure actual educators’ skills in EBP activities could lessen this knowledge gap as it has been done with French general practitioners, for example (Rousselot et al., 2018).

All enablers in EBP engagement were rated as being either moderately or very useful by all participating teaching osteopaths as it was the case in previous studies (Alvarez et al., 2021; Cerritelli et al., 2021; Leach et al., 2019, 2020; Sundberg et al., 2018). These facilitators included improving access to full-text journal articles, internet in the workplace, free online databases, online EBP education materials, critical reviews of research evidence relating to osteopathy, research rating tools, online tools that facilitate practitioner appraisal of the evidence, databases requiring licence fees, critically appraised topics relating to osteopathy, and critical appraisal tools.

6.5 Limitations

Some biases inherent to cross-sectional survey designs cannot be excluded, including (Choi & Pak, 2004) :

- Selection bias. Educators who already had a positive image of EBP may have tended to be more willing to respond than those with a more negative image. It may provide inaccurate findings that don't adequately convey the opinions and traits of the overall educators' population.
- Response bias. Respondents may have been affected by factors like acquiescence bias (or a tendency to agree with EBP regardless of one's real opinions and beliefs) and social desirability bias (respondents giving answers they feel are socially acceptable as educators).
- Cognitive bias. Least qualified educators in the field of EBP may have overestimated their expertise and knowledge (Dunning-Kruger effect).
- Recall bias. Participants could have trouble accurately recalling past EBP use and activities leading to an inaccurate estimation.

The original EBASE questionnaire is a validated measurement tool with assessed psychometric properties (Terhorst et al., 2016). However, this is not the case for the French version of the questionnaire specifically translated for this study (test-retest reliability or construct and content validity of the questionnaire are unknown). Nevertheless, the translation of the questionnaire adhered to established methodologies (Beaton et al., 2000), the questionnaire underwent a pilot testing phase and Cronbach's alpha calculation showed a high level of internal consistency for the three subscores of the study. In any case, these aspects should be reflected in interpreting the results.

Finally, the study was conducted in two similar OEIs with regards to student capacity, teaching methods and staffing levels. However, it is unclear if this sample truly represents what is commonly observed in OEIs in France. This limits the external validity of the study. Additionally, since there is no previous research on the engagement of French osteopaths with EBP, it cannot be determined if educators represent a specific population in terms of their attitudes, skills, and utilisation of EBP.

6.6 Implication for education

When educators embody and enact the principles of EBP and consistently exemplify the integration of research evidence into clinical decision-making, they inspire their students to embrace EBP as a core value (Lam & Schubert, 2019). Educators can cultivate a culture that promotes curiosity, critical thinking, and a lifelong pursuit of knowledge by emphasising the significance of thoroughly assessing and using the most reliable evidence. In addition, teachers who successfully convey the value and advantages of EBP contribute to narrowing the knowledge gap between theory and practice (Albarqouni et al., 2018). They encourage learners to apply EBP to increase patient outcomes, raise the standard of care, and move the profession forward (Abrey et al., 2022). Educators may forge a generation of healthcare professionals who respect and prioritise evidence-based treatment via their lectures, supervision, and mentorship. Furthermore, educators seem critical as they assist students in developing their professional identities and ethical standards (Phillips, 2022). They foster a feeling of professional and ethical responsibility in their learners by demonstrating integrity, empathy, and a dedication to patient-centred care (Tyreman, 2018). This, in turn, affects the connections and results that patients impacted by the care these future professionals offer may encounter (Chrisman-Khawam & Manzi, 2020).

Our understanding of the clinical proficiency and application of EBP in the osteopathic educating community may be deepened and further understood by qualitative study methodologies. Acquiring a comprehensive understanding of the perspectives, beliefs, and ideas held by osteopaths who adhere to traditional concepts and principles (Figg-Latham & Rajendran, 2017), as well as those who do not follow evidence-based clinical guidance (Inman & Thomson, 2019; Kasiri-Martino & Bright, 2016), could be highly advantageous. This valuable information might be used to create targeted educational initiatives specifically designed to promote EBP uptake. By taking into account the diverse viewpoints, educational strategies might be customised to cater to osteopaths' unique requirements and challenges, which can ultimately lead to the effective promotion and implementation of EBP.

Initiatives for collaborative research projects supported by joint efforts among educational, academic, and professional actors may also be a promising future for osteopathy (Tapp & Dulin, 2010). Results of our study indicate that although respondents frequently sought colleagues’ expertise to assist clinical decision-making, only a quarter belonged to a professional or academic organisation. Such projects have been carried

out in Australia and New Zealand, leading to several accomplishments linking academic and professional osteopaths, such as the founding of practice-based research networks (PBRN) and resulting academic publications (Adams et al., 2018; Fleischmann et al., 2021; Steel et al., 2019, 2020; Vaughan et al., 2023).

7 Conclusion

The findings of this study have shed light on the attitudes, skills, and utilization of EBP among French osteopaths who teach. It has provided us with a better understanding of their approach towards evidence-based practice, which can help improve the overall quality of osteopathy education in the French context and, ultimately, in patient care. Based on the results, the osteopaths who participated in the study generally have a positive view of EBP. They indicated that they possess moderate-level skills in EBP and engage in related activities to a moderate-low extent. The lack of clinical evidence in osteopathy was perceived as an impediment to EBP uptake. It's worth noting and encouraging that a significant proportion of the respondents (85%) expressed a desire to enhance their skills in order to better integrate EBP into their clinical practice. Since the study was limited to two OEIs, it is impossible to generalize the results. Despite its limitations, the study certainly adds to our understanding of osteopathic education in the French context and establishes a basis for future research, including more widely professionals. The role of osteopathy educators is truly unique and significant among osteopaths. Educators profoundly influence their patients, students, and even indirectly on those their students treat through their approach, beliefs, and skills. As educators, they serve as role models, shaping the attitudes and behaviours of their learners. Their teaching style, clinical practices, and professional values have the potential to leave a lasting imprint on future healthcare providers under their guidance. More research will be needed to investigate solutions intended to improve and implement the skills and use of EBP among French osteopaths who teach.

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Participant information sheet

Title of the study: Attitudes, skills, and use of evidence-based practice by French osteopaths who teach - A cross-sectional study

Invitation to participate in research study

We would like to invite you to take part in our research study, where we aim to characterize the use of evidence-based practice by French osteopaths who teach. You are invited to fill in this form as an IO-RB teacher. The participation of the majority of osteopaths teaching at the IO-RB is desired.

This information sheet describes the study and your role in it. Before you make your decision, it is important that you understand why this study is being conducted and what it means for you. Take time to read this information, and discuss it with others if you wish. If anything is not clear, or if you would like more information, please ask us.

Voluntary participation

Participation in this study is entirely voluntary. You can withdraw from the study at any time without giving any reason and without any negative consequences. If you withdraw from the study or withdraw your consent, any data collected from you prior to this withdrawal may be included in the research data.

Purpose of the study

Evidence-based practice is an interdisciplinary approach to clinical practice that incorporates three main elements: the best research evidence, the clinical expertise of the practitioner and the preferences (and values) of the patient. The aim of this study is to explore their use by osteopathic teachers.

Who is organising the research?

This study is being carried out by Hakim Mhadhbi as part of his thesis for the Master of Osteopathy at Metropolia University of Applied Sciences, Helsinki, Finland.

What will participation involve?

Participation in this study involves taking about 10-15 minutes to complete the questionnaire. Emails inviting you to participate in the study will be sent after 2 and 4 weeks; please ignore these reminder emails when you have already completed the questionnaire. No further reminder emails will be sent thereafter.

If you decide to participate in the study, you are invited to complete the questionnaire online using the link provided. This link is generic and will not retain your email address. The questionnaire contains questions about evidence-based practice and your perceptions of its use in your clinical practice, and some demographic questions. However, there are no questions that identify you. After completing the questionnaire, you will be invited to submit it. During the course of the questionnaire, you will have the opportunity to withdraw from the study at any time. However, once the questionnaire has been submitted, it will not be possible to withdraw the data submitted. The submission of the completed questionnaire will be considered as your consent to participate in the study.

Potential benefits of participation

Although there is no direct benefit, you will be helping to identify the type of knowledge that underpins current osteopathic education in France. This information may be useful in informing and guiding osteopathic education in the future.

Possible disadvantages and risks of participation

There are no risks associated with participating in this study. However, you may feel slightly anxious about completing the questionnaire by not answering correctly. However, there is no right or wrong answer to any of the questions, as they reflect your personal views on the subject. The possible disadvantage of participating in the study is the time commitment.

Financial information

There will be no cost to you for participating in this study. You will not receive any payment for your participation.

Information about the results of the research

The results obtained from the questionnaires will be analysed and written up as a dissertation for Hakim Mhadhbi's Master's degree in Osteopathy at Metropolia University and possibly for publication in a journal and/or the results for presentation at scientific conferences. No participant can or will be identified in any report, presentation or publication.

Additional information

Further information about the study can be requested from the study leader: Hakim Mhadhbi

Contact details of the researchers

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Participant consent form

Title of the study: Attitudes, skills, and use of evidence-based practice by French osteopaths who teach - A cross-sectional study

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- I have been invited to participate in the above-mentioned research study. The aim of the research is to explore the representations, mastery and use of practice based on the knowledge of osteopaths who teach.
- I have read and understood the written participant information sheet.
- I have received sufficient information about the above-mentioned study, its purpose and process, my rights and the benefits and risks involved. I have had the opportunity to ask questions about the study and have received satisfactory answers.
- I was sufficiently informed about the collection, processing and transfer/disclosure of my personal data during the study and the privacy notice was available.
- I was not pressured or persuaded to participate in the study.
- I have had sufficient time to consider my participation in the study.

- I understand that my participation is entirely voluntary and that I am free to withdraw my consent at any time, without giving any reason. I am aware that if I withdraw from the study or withdraw my consent, any data collected from me before my withdrawal may be included in the research data.
- By completing this form, I confirm that I voluntarily consent to participate in this study.
- If the legal basis for the processing of personal data in this study is consent given by the data subject, by proceeding, I am granting consent for the processing of my personal data. I have the right to withdraw consent for the processing of personal data as described in the privacy notice.