International Journal of Osteopathic Medicine 35 (2020) 1–4

Contents lists available at ScienceDirect

International Journal of Osteopathic Medicine

journal homepage: www.elsevier.com/locate/ijosm

Models and theoretical frameworks for osteopathic care – A critical view and call for updates and research

A health profession often owns its identity by the originality and relevance of therapeutic models it defends [1]. Historically, part of the success of osteopathic care among patients may be explained by the innovative approaches that emerged in the first 100 years of its existence. During this time, osteopathic models and principles defended concepts that were to become central across health disciplines in the 21st century. In Western medicine, osteopathy was indeed among the first medical disciplines to emphasise the importance of person-centred care [2]. Notwithstanding this pioneering role in person-centred care, inherited from traditional medicine principles [3], some of the profession's conceptual bases are no longer regarded as unique but have progressively been incorporated in the entire medical field, especially in general medicine, and are now widely recommended as best practice. In fact, in the specific case of musculoskeletal care, Caneiro and colleagues [4] have recently argued that it is time to move beyond 'body region silos' to manage musculoskeletal pain, and fully embrace a person-centred active approach to treating musculoskeletal pain and disability with a critical thinking approach. Thus, what osteopaths have traditionally claimed to be their unique selling points, are now regarded as mainstream healthcare according to the scientific evidence available.

Despite the claimed person-centredness of osteopathic care, clinicians have traditionally mainly focused on a biomedical model of care [5]. Central to this traditional approach to osteopathic evaluation and treatment, and still adopted by many practitioners, is the diagnosis of somatic dysfunction [6]. For those who still consider somatic dysfunction as a relevant clinical entity, the concept focuses on ways to detect and resolve objective structural signs at the origin of the patient's symptoms, function and general health and is typically treated using manipulative procedures [6,7]. The conceptual basis of somatic dysfunction implies the reliance on a simple cause-effect model of osteopathic care. Whilst causality is clinically attractive, human behaviour is inherently complex and influenced by an array of factors at many different levels; therefore, establishing clinical causality in complexity is either extremely difficult or impossible to achieve [8]. Although clinical phenomena associated with somatic dysfunction may be biologically plausible, the concept fails to integrate social and psychological aspects, and the relationship between somatic dysfunction and health status has not been established [9]. Moreover, the concept reflects outdated theories from the early 20th century that reinforces the belief in a structural cause of pain [6]. Faced with these ongoing challenges, research in the field of osteopathy has recently started to investigate the importance of other aspects of care such as practitioner-person interactions [10], affective touch [11], interoception [12,13], contextualisation [14,15] and placebo [16].

Scholars and academics from the field are now openly expressing their difficulties in understanding, explaining, defending, and justifying central models of osteopathic care [6,17–21]. We would argue that incoherence within models, lack of theoretical and empirical support, oversimplification, pseudoscience, and absence of consensus over the validity of the profession's conceptual framework are some of the challenges osteopathic education and research are facing.

There is an overall scientific consensus on the importance of having a robust theoretical framework for complex health interventions such as osteopathic care [22]. Traditional or innovative theoretical models are more likely to be accepted and implemented if they provide guidance on the process of care, clearly frame their intent and level of application, are logically plausible and consistent, are backed up by a rational documented understanding of the change process including causal relationships among the constructs, are testable, are supported by empirical observations, show good explanatory power, and are generalisable to different settings and subpopulations [23]. Unfortunately, in osteopathic education, taught models largely depend on tradition and political priorities rather than scientific standards. An example of this is the "Five osteopathic models" of care agreed upon by policymakers during the elaboration of the WHO report [24]. The model sets five alternative views through which a patient's musculoskeletal condition can be evaluated, understood and treated; the biomedical-structural model, the respiratory-circulatory model, the metabolic-nutritional model, the neurological model, and the behavioural-psychosocial model. The overall model does not provide any testable components of any underlying theory. It does not, therefore, meet expected standards for a theoretical model on many points [20] and is largely insufficient to justify the profession's identity in higher education programmes [25,26]. The "Five osteopathic models" approach has nevertheless been broadly adopted nationally and institutionally by many countries and training institutions, arguably without the required level of critical analysis [7,27]. Robust assessment, revision, and consensus of theoretical models in osteopathy are still lacking and require clearer views on what to expect from theoretical models (Table 1).

https://doi.org/10.1016/j.ijosm.2020.01.003

Table 1
COME Collaboration Evidence Scale for guiding confidence in theoretical models used in care.

Level of evidence	Name	Criteria	Examples[a]	Expected practical attitude
A	Generalized theory	Theory resisted multiple temptations of falsification in different settings and with different populations. Consistent over time.	Person-centred theory, health hygiene theory, vaccine immunisation theory	Can be fully trusted without however excluding potential exceptions
B	Explanatory theory	Practical application tested and validated for specific populations or/and settings. Theory capable of explaining and predicting useful observed phenomenon.	Phenomenological models of the body, nutritional theory, cognitive behavioural theory, goal setting theory, transtheoretical model of change	Can be trusted in known explored settings at specific analytical levels
C	Model with empirical support	Testable relationships or construct confronted and supported by empirical observations. Findings support plausibility, consistency and construct of the model.	Neurophysiological mechanisms for spinal manipulation, neurovegetative allostatic model, motor energy-efficiency model, predictive processing theory, psychosocial determinants of health models, health literacy models	Can be used to explain some clinical or public health observations
D	Models with expert consensus alone	Consensus on construct with explicit explanation on causal relationships. Consistent, plausible and useful in providing guidance on the process of care.	"Five osteopathic models" approach	Can be used cautiously in practice in absence of a better model
E	Untested hypothetical model without broad consensus	Testable, plausible model with apparent internal consistency.	Osteopathic somatic dysfunction, the bioenergetic model, the motility model	Only rely on such models with much scepticism
F	Existing evidence against model	Internal incoherence, major inconsistencies with existing models of high level of evidence, or model repeatably contradicted by empirical observations.	Chiropractic subluxation model, Magoun's cranial model, homeopathic dilution theory, meridian traditional theory in acupuncture	Model not to be used as they are known to mislead and can generate mistrust

[a] Examples are for illustration purposes only and are not exhaustive. Level of evidence of each example is subject to changes depending of cumulated evidence.'

Nevertheless, the surrounding knowledge from other disciplines has never thrived as much. Behavioural and cognitive psychology, occupational therapy, physiotherapy, nursing and family medicine are moving forward at a high pace developing relevant models of care that enlightening the entire science community (Table 1). Although historical models for bodily symptoms assumed either purely psychological or biological causes and mechanisms [28], a situation analogous to that witnessed in the field of osteopathy, most current models are more balanced and biopsychosocial in nature. However, despite the current primacy of the biopsychosocial model of care, Henningsen and co-workers [28] have recently argued that explaining the mechanisms, nature and interplay of the biological, psychological and social factors is challenging and many questions remain.

Osteopathic clinical practice is by and large characterised by complexity. Many of our patients present with an array of bodily symptoms that frequently do not fit a particular clinical condition or are suitable to a biomechanically biased model of osteopathic care. Arguably, patients feel pain because they predict that they are in pain, based on an integration of sensory inputs, prior experience, and contextual cues [29]. On a critical appraisal of the biopsychosocial model, Stilwell and Harman [30] propose an enactive view of pain as a relational and emergent process of sense-making through a lived body, which cannot be separated from the world that we shape and that shapes us. This phenomenological, enactive approach to pain as sense-making, is arguably fully aligned with the osteopathic person-centred model of care. These new developing models provide, in our opinion, an opportunity for the profession to embrace change and develop robust evidence-informed models of care.

Research active educators in osteopathy embrace these models that often provide awaited solutions to the profession's conundrums. However, the profession is facing significant challenges in carrying them forward and integrating them into education and practice [31–33]. During the past 15 years, there is, however, an observable expanding gap between what is taught in osteopathic education and what is known by the scientific community [12,13,34,35]. In this context, clinician-scientist could play an essential role as bridge-builders between emerging knowledge and tradition [32,36].

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 [37]. Providing clarity on norms and expectations (Table 1), favouring exposure to rich clinic experiences, and shaping the culture of the profession would contribute to professional identity formation [38–40]. Some promising leads could be to open discussions about osteopathic principles, evidence-informed education in osteopathy [41–43], considering opportunities for 'think tanks' to inform policymakers, reach agreement on models relying on quality consensus studies, include patient, practitioner and experts in discussions, and structure our research to focus on building our foundations [44]. Table 2 provides some suggested steps to put in place before proposing models of care in osteopathic education.

Rather than locking the profession within a set framework, the profession could benefit from valuing innovation and originality in new emerging models and theoretical frameworks of care as long as the underlying methodology for their development is appropriate. There is a need for extensive exposure to critical judgment and identifications of strengths and limitations of each model. We argue that the recent developments in the fields of pain science and musculoskeletal care, which endorse "osteopathic" concepts of person-centred care, provide a unique window of opportunity for the development and dissemination of evidence-based models of osteopathic care, to foster a stronger professional identity and to the recognition of osteopathy as a mainstream healthcare discipline.

Table 2
Suggested methodological steps for the development of osteopathic care theoretical models.

Steps	Goal	Possible methods
1. Background	Obtain an overview of what is known around the concepts under development.	Scoping review
2. Theoretical construct	Generate a first draft of the overall framework for the model. Clearly describe assumptions. Obtain feedback from experts, practitioners and patients on consistency, plausibility, generalisability, relevance, and expected applicability.	Grounded theory, face validity, mixed approaches
3. Proof of concept	Build empirical support by confronting the model to falsifiability.	Experimental paradigms, prospective case series, practice review
4. Acceptability/appropriateness	Test overall acceptability of proposed model and identify strength and limitations	Fidelity study, content analysis, consensus study
5. Implementation and consolidation	Communicate model and evaluate implementation. Revise model when necessary (back to step 3 or 4).	Clear description of model with theoretical framework and assumptions, monitor use in practice or education, collect continuous feedback (evaluation)

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