

Opposing Vaccine Hesitancy During the Covid-19 Pandemic - A Critical Commentary and United Statement of the International Osteopathic Research Community

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Current situation

The covid-19 pandemic has resulted in an unprecedented impact on the social, mental and physical health of the global population (Torales et al. 2020; Shaukat, Ali, and Razzak 2020; Abrams and Szeffler 2020). It is only now, more than a year since the beginning of the pandemic, that through remarkable medical and scientific innovation there are several safe and effective vaccines for covid-19, and more are being developed (Dai and Gao 2021; Tumban 2020). Vaccines have now been approved by regulators across the world and much hope rests on these to bring a return to a degree of pre-pandemic life, saving lives by preventing the illness in the most vulnerable and speeding up the course of the pandemic until large proportions of the population are immunised (Tumban 2020). Research has confirmed that healthcare professionals (HCPs), such as osteopaths, will make an important contribution to patients' decision-making regarding the uptake of vaccination, and that osteopaths' own beliefs, confidence and behaviours with respect to vaccination will influence their recommendations to others (Paterson et al. 2016).

Anecdotal evidence in the form of intraprofessional discourse and posts on social media suggest that a majority of osteopaths support the public health messages delivered and recommended (Swiss Osteopathy Science Foundation 2020), are keen to get vaccinated, and where local regulations permit, even assist to administer the vaccine (Institute of Osteopathy 2021) and there are examples of DOs in the USA organizing other healthcare professional organizations in the endeavour (Cain 2020). However, we are concerned with the negative sentiments, ill-formed views and in some cases frank scepticism regarding vaccines amongst what appears to be small sections of the osteopathic profession. There is concern globally at views that have been expressed on social media and within other intra-health professional groups and settings (UNICEF 2013).

To our knowledge, there is no published research on osteopaths' beliefs and attitudes towards vaccines, and this should be a research priority given the profession's role in health promotion. Research is needed to better understand the breadth of views and beliefs of osteopaths' in regard to vaccination and to develop deeper insights into the beliefs which inform osteopaths' behaviour with respect to vaccination uptake and advice. However, as will be outlined below, research into vaccine hesitancy amongst the public and HCPs, plus osteopathy's professional emergence, theory and principles, may facilitate vaccine hesitant views amongst clinicians, and ultimately be detrimental to their patients' and the wider public health efforts during the ongoing covid-19 pandemic.

Since the start of the pandemic, concerns have been raised by some members of the osteopathic (Draper-Rodi, Vaucher, and Thomson 2020) and chiropractic (Côté et al. 2020; Axén et al. 2020) professions regarding pseudoscientific claims and misinformation promoted by clinicians and researchers alike, regarding the role that these professions' interventions may have on the prevention and morbidity of covid-19 infections. Our paper continues in a similar vein, but with a specific focus on the concept of vaccine hesitancy and scepticism directed towards vaccines amongst osteopaths and their patients. We aim to highlight the issue of vaccine hesitancy and illuminate why osteopaths or patients may hold hesitant views towards vaccines to enhance collaborative practice, shared decision-making and stimulate a discourse. Strategies to support health should be informed by an appropriate level of

evidence, to facilitate fair debate and transparent decision making. This allows the public to have confidence in the veracity of the information presented to them by professionals and make informed autonomous choices, based on accurate information.

Vaccine hesitancy

In 1796 the smallpox vaccine was introduced and became the foundation of modern vaccinology (Esparza, Nitsche, and Damaso 2018). Since that time, the different views that an individual holds about vaccines and vaccination have been said to lie on a continuum ranging from complete acceptance to complete refusal (Larson et al. 2014). Negative views and ideologies around vaccines have been traced back to the 1840s (Wolfe and Sharp 2002) the social, cultural, psychological and contextual factors which lead to the different positions are varied and complex (Larson et al. 2014). Underpinning many of these views are concerns around the risks, safety and harms of vaccines and in some cases, a breach of individual freedom of choice and autonomy (Poland and Jacobson 2001) and mistrust of medicine (Hornsey, Lobera, and Díaz-Catalán 2020). The term 'vaccine hesitancy' has recently emerged as a less polarising alternative to describe an individual's position on vaccines, rather than as 'anti-vax' or 'vaccine skeptic' (Larson et al. 2014). Vaccine hesitancy has been defined as the *"delay in acceptance or refusal of vaccination despite availability of vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place and vaccines. It is influenced by factors such as complacency, convenience and confidence"* (MacDonald and SAGE Working Group on Vaccine Hesitancy 2015), and has been considered by the World Health Organization (WHO) as one of the top ten threats to global health (Godlee 2019). The issue of vaccine hesitancy is a worldwide phenomenon amongst the public (Larson et al. 2016), and increasingly observed in marginalised and minority ethnic groups (Robertson et al. 2021).

The expediency with which vaccines have been developed and approved can legitimately raise certain initial questions (and even 'hesitancy') amongst HCPs and patients. Further uncertainty may have developed when data on vaccine effectiveness from early trials (Mahase 2020) and dosing regimens (Mahase 2021) created some confusion within the scientific community and media. Nevertheless, osteopaths have a role in facilitating patients' access reliable and credible information regarding vaccines (WHO 2021) to support shared decision making and health promotion.

There are concerns that vaccine hesitancy will represent a major global challenge to the long term control of covid-19 and overcoming the pandemic (COCONEL Group 2020; Palamenghi et al. 2020; Dror et al. 2020; Lee and Sibley 2020). Recent research suggests negative attitudes towards covid-19 vaccines are a major public health concern (Paul, Steptoe, and Fancourt 2021). Specifically, individuals that consult complementary and alternative medicine (CAM) practitioners (of which osteopathy can be considered to have arisen from, and which, in where some countries, continues to be considered CAM rather than a HCP (Organization and Others 2010)) tend to be more vaccine hesitant than non-CAM users (Hornsey, Lobera, and Díaz-Catalán 2020). This tendency may possibly be due to their broader health beliefs and the direct influence that CAM practitioners have on the vaccine attitudes of their patients is

unclear (Bryden et al. 2018). Given this, osteopaths should be cautious and precise in how they communicate information regarding vaccination with their patients.

Uncertainties, questions and concerns regarding vaccines

Determinants of vaccine hesitancy are not so straightforward but are thought to extend to cultural beliefs, health education, access to care, and language barriers (Larson et al. 2014) and for some people, a distrust of authority may also be a factor (Nichols 2017). Given the complexity of the underlying phenomenon, there are no clear tailored interventions to reduce unfounded scepticism (Ultsch et al. 2016). Overall, individuals who tend to feel over-cautious about vaccines are often those who are inclined to conspiratorial thinking, have individualistic and hierarchical worldviews, accord importance to their sense of freedom of behaviour, or dislike the sight of blood or needles (Hornsey, Harris, and Fielding 2018). Overconfidence is also believed to play a major role in the broader maintenance of one’s beliefs (Motta, Callaghan, and Sylvester 2018) and making it difficult to distinguish facts from fallacies (Stolle et al. 2020). Osteopaths should be sensitive to any potential opportunities to positively inform patients’ opinions of vaccines (Davis et al. 2015) and seek to understand, recognise and address any underlying fears they may have (Poland and Jacobson 2001). **Table 1** summarizes some of the identified fears that can help maintain hesitancy of vaccines and vaccination.

Type of fear	Advantage	Rationale	Underlying theory
Fear of being forced	Owning one's decision	Tempting to gain freedom of behaviour when a decision seems forced. Natural reaction against authority or unwanted consumerism.	Reactance theory (DeStefano and Shimabukuro 2019)
Mistrust	Protection against manipulation	Fair-minded scepticism with affinity for conspiracy theories. Often linked to schizotypy, dangerous-world beliefs, and “bullshit receptivity” (Hart and Graether 2018)	Overconfidence (Motta, Callaghan, and Sylvester 2018)
Fear of adverse events	Avoid risks	Safety concerns increased by the false impression that adverse events are much more present than invisible benefits. With conflicting messages, the preferred decision is often inaction.	Risk avoidance theory Status quo bias (DeStefano and Shimabukuro 2019)
Fear of needles	Rationalising phobia	Risks of infection, pain (Hervé et al. 2019)	Trypanophobia (McLenon and Rogers 2019)

Table 1. Examples of underlying fears motivating vaccine hesitancy

With respect to vaccines, the main falsehoods and misinformation that circulate are on the claimed associations between MMR vaccination and autism spectrum disorders (DeStefano and Shimabukuro 2019), hepatitis B vaccines and multiple sclerosis (Mouchet et al. 2018), aluminium intoxication (Goullé and Grangeot-Keros 2020), and more recently, microchip inoculation (Nuzhath et al. 2020). Even when independent scientific committees and multiple research teams investigate such allegations and provide strong evidence that they cannot be true (François et al. 2005), these beliefs seem to continue being propagated on social media.

Online threads related to vaccines mainly concern safety and effectiveness, conspiracy theories, mistrust in science and authorities, freedom of choice, absence of intent for any vaccination, and religious beliefs (Nuzhath et al. 2020).

There has been increasing interest in better understanding the origin and perpetuation of misinformation and conspiracy theorising in relation to many aspects of the covid-19 pandemic, including vaccines, use of face masks and the reality or existence of the pandemic itself (Agle and Xiao 2021). Emotional components are more frequent in false anti-vaccine messages and help propagate them faster and to more people on social media than true ones (Okuhara et al. 2020; Vosoughi, Roy, and Aral 2018). Consumers of such information often feel torn between the quantity of perceived negative emotional anti-vaccine messages, and the sparsity of complex and factual pro-vaccine arguments. In such conflicting situations, some people can opt for the status quo, naturally choose inaction, and end up remaining unvaccinated (Damman et al. 2009; Samuelson and Zeckhauser 1988).

Those most vulnerable to misconceptions about vaccinations are those who tend to rely on social media for information, have low levels of health literacy, and often question the legitimacy of science and medical authorities (Dubé et al. 2013; Hart and Graether 2018). Osteopathic practitioners could play a central role in recognising patients fears, help solve potential misconceptions, and have patients make an informed decision about vaccination. Given the seemingly quick development of vaccines, plus the lack of specialist vaccine technical knowledge of osteopaths, it is understandable that practitioners have questions and concerns. Before endorsing their role as advocates, it is important for osteopaths to recognise and understand the grounding of their own position towards vaccination. Like any other healthcare professionals, osteopaths are also inclined to be vulnerable to confirmation bias (increased affinity for information that confirms prior beliefs), false-cause fallacy (seeing causes in correlations), cognitive dissonance (resolving conflicting thoughts by ignoring one aspect), heuristic bias (giving undue weight to certain arguments over others), and bias of omission (holding beliefs even in the absence of evidence) (Stolle et al. 2020).

Osteopathy's history and theory - a context for vaccine hesitancy

Osteopathy's history, inception and professionalisation may offer some possible reasons as to why some osteopaths may hold negative views towards vaccines. A T Still founded osteopathy in the late 1800s, in the midwestern USA. It is widely claimed osteopathy arose, in part, as a response to the crude practice of medicine at the time and in particular following the tragic death of three of Still's children from spinal Meningitis (Lewis 2012) . It is reported that Still felt 'philosophically divorced' from orthodox medicine, and developed osteopathy in response to the perceived failings of medicine at the time, viewing osteopathy as a profession philosophically underpinned by the body's natural healing capacity (Stark 2013). Needless to say, osteopathy and 19th century medicine 'got off on the wrong foot' and this early mistrust of medicine may have contributed to the development of negative views towards medical interventions and propagation of osteopathy-centric ideologies which continue to be held by some osteopaths over 100 years later (Grundy and Vogel 2005; Figg-Latham and Rajendran 2017), and possibly 'primed' some osteopaths (and possibly vicariously their patients)

(Hornsey, Lobera, and Díaz-Catalán 2020) to engender vaccine hesitant views, despite Still's beliefs arising from the context, limitations and knowledge of the time.

The epistemology of osteopathy (i.e. the types of knowledge which informs practice and the ways that this knowledge can be generated or 'known') (Fish and Coles 1998) has been considered to lean towards positivism, (Thomson, Petty, and Moore 2014a); inasmuch as practice appears to emphasise biomedical-dualist knowledge (Tyreman 2013). Such forms of knowledge include anatomy, physiology and biomechanics relating to the patient's body, which can be identified and causally affected by osteopaths through manual therapy techniques. This sets up a 'biomedical paradox', where other (i.e., 'non-osteopathic') interventions (such as vaccines) which are underpinned by similar biomedical assumptions are rejected on account for being the 'wrong type of biomedicalism' because they have been derived from and delivered by medicine. Looking further into osteopathic traditional principles and epistemology, there are obvious examples of edicts which would appear to be compatible with vaccine hesitant views (such as vaccines are 'unnatural' (Stolle et al. 2020)), 'the human body provides *all* the chemicals necessary for the needs of tissues and organs' (stress added) (Seffinger et al. 2003), and evidence that Still positioned osteopathy as being opposed to vaccination (Still 1910). That said, the extent to which these traditional concepts and principles feature in the clinical reasoning and practice of osteopaths in modern times varies (Kasiri-Martino and Bright 2016).

Osteopaths' attitudes towards regulation, public health and evidence-based guidance

Contemporary evidence suggests some osteopaths are resistant or reluctant to adopt evidence-based guidance for musculoskeletal complaints and this reticence may provide an insight into the possible reasons for vaccine hesitancy amongst osteopaths. For example, (Figg-Latham and Rajendran 2017; Inman and Thomson 2019) have reported that some osteopaths feel that traditional osteopathic theory and principles takes precedence over evidence-based guidance for back pain. Osteopaths' professional views and identities (Alvarez, Van Biesen, and Roura 2020) may also be a reason as to why some practitioners are hesitant in regard to vaccines. For example, some osteopaths have conceptions of practice which prioritise traditional osteopathic knowledge and skills (Thomson, Petty, and Moore 2014a, 2014b) excluding other forms of knowledge from outside the discipline. Further, practitioners may feel vaccines are not aligned with the original values and principles as espoused by Still and other early practitioners of 19th century osteopathy. For some, these anachronistic values appear to be compatible with common fallacies which consider vaccines to be 'unnatural' (and therefore harmful) or a mistrust of the medical and pharmaceutical industries (Stolle et al. 2020).

A national mixed-methods study into osteopaths' attitudes towards regulation from the United Kingdom (McGivern et al 2015) show strong professional beliefs amongst some osteopaths such as 'osteopathic practice is distinctive' and is 'unique from other health care professions' and that some practitioners see themselves as 'osteopaths first, and then as a healthcare professional'. These data seem to be confirmed elsewhere, such as continental Europe (Cerritelli et al. 2020; Alvarez et al. 2020; Cerritelli et al. 2019; van Dun, Nicolaie, and

Van Messem 2016) and Quebec (Morin and Aubin 2014). Here studies indicated that most practitioners believed that osteopathy should be regulated as a distinct health care profession. These combined with concerns that some osteopaths have that 'pharmaceutical' models of research and evidence does not fit with osteopathic holism practice (McGivern et al 2015). Together with the common working context of osteopathic clinical practice in many countries, where the vast majority of practitioners work outside of the public health system (such as the UK NHS) in which there are accepted and expected behaviours, attitudes and values with regards to promoting public health information, may all be forces which motivate osteopaths to hesitate with regards to the promotion of vaccines.

Professional obligations and expectations

Most (if not all) standards of osteopathic practice globally are clear on the expectation that osteopaths advocate for public health and health promotion activities, and partner with patients to help them make decisions about their health (GOsC 2018; Osteopathy Board of Australia 2019). Since the start of the pandemic, osteopathic regulators worldwide (for example (General Osteopathic Council 2021; Unité Pour l'Ostéopathie 2020; Registro de Osteópatas de España 2020) have outlined additional requirements and guidance (e.g. infection control measures) when working closely with patients during covid-19 pandemic.

In conjunction with a broader societal moral obligation to contribute to herd immunity through vaccination (Giubilini, Douglas, and Savulescu 2018), osteopaths have a more local public health and ethical responsibility to protect their own patients by volunteering to receive any approved covid-19 vaccine (where vaccination is not medically contraindicated) to diminish the risk of transmission of the virus within the context of clinical osteopathic care (Theodoridou 2014). Further to this, research indicates that vaccinated healthcare professionals are more likely to recommend vaccination to others (Paterson et al. 2016). Osteopaths should ensure they are 'informed advocates' during the covid-19 vaccine roll out and beyond (Poland and Jacobson 2001) . This entails providing their patients with balanced views based on credible sources of information (CDC 2021; Public Health England 2021) rather than unscientific speculation, and erroneous inference from traditional dogma.

Summary

The trusted role and professional standing that osteopaths have with their patients and within their wider communities requires that the information and messages they communicate are informed by and congruent with current evidence, public health guidance and scientific consensus. This expectation is even more critical during the covid-19 pandemic, particularly in relation to sharing information and decisions with patients regarding vaccination. All osteopaths have a social, moral and professional duty to contribute to the prevention of the transmission of infectious diseases. Practitioners must be critically aware when traditional osteopathic theories, principles and ideology may appear to contradict public health advice. Osteopaths should correct any erroneous reasoning, false claims or misleading messaging to

ensure that their professional practice and advice follows the most robust and recent evidence, public health advice and regulatory requirements.

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