Demystifying Contemporary Chiropractic Professional Identity

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Abstract

The lack of clarity surrounding the role of chiropractic within the healthcare landscape has been attributed to disharmony from within the profession. This internal discord arises from differing perspectives on professional identity and varying approaches to patient care, rooted in distinct philosophical and therapeutic orientations. The historical struggle for identity within the chiropractic field has resulted in fragmentation, further complicating the profession's overall identity. These conflicting views and the absence of a shared identity make it challenging to distinguish chiropractic from related healthcare professions, emphasising the vital need for establishing a clear professional identity in healthcare. Despite chiropractic being formally recognised as a health profession with demonstrated clinical efficacy, achieving a shared sense of chiropractic identity remains elusive. To drive progress in the broader healthcare arena, establishing a cohesive and unified approach becomes imperative.

Understanding professional identity, which encompasses how professionals perceive themselves and their work both individually and collectively, is crucial for understanding professional behaviours across various contexts. However, exploring professional identity within the realm of chiropractic necessitates a comprehensive analysis of its diverse components and intricate facets. The clarification of chiropractic professional identity (CPI) carries significant implications, including improving patient care, fostering collaboration, and strengthening the profession's position in healthcare.

The research for this thesis comprised an initial focus on understanding the current state of CPI among practicing chiropractors, achieved through an in-depth critical review of existing literature. An evident lack of a formal definition for CPI underscored the need for a deeper understanding and clarification of its constituent elements. The final phase of this research was dedicated to the development and validation of a novel measurement tool known as the Chiropractic Professional Identity Embodiment Scale (CPIES). The psychometric evaluation of the 15-item CPIES demonstrated to be both valid and reliable with very strong test-retest reliability.

The establishment of a clear professional identity within the chiropractic field is of paramount importance to facilitate effective collaboration, streamlined communication, and

the realisation of a unified vision for the future. The utilisation of a validated instrument such as the 15-item CPIES, either as a comprehensive unidimensional scale, or by employing its component subscales to assess various aspects of CPI, can significantly expedite this process. The profound implications of gaining a deeper understanding and assessing CPI extend to enhancing career success and overall satisfaction for chiropractic professionals. This research ultimately contributes practical solutions and innovative insights into the complicated construct of CPI with far-reaching implications for practitioners, educators, and the chiropractic profession as a whole.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signature:

Date: 9th October 2024

Co-Authored Works

The contribution of co-authors for publications arising from these studies and from whom approval has been granted for inclusion in this doctoral thesis, is as follows:

Works in Publications

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Candidate Contributions to Co-Authored Papers

While this thesis predominantly comprises my own ideas and efforts, it is important to acknowledge the guidance and contributions of my supervisors were instrumental in making this possible. It should be noted that after the first publication outlined in Chapter 3, due to a country relocation (Associate Professor Panteá Farvid), my secondary supervisor became my primary one (Professor Chris Krägeloh), and a new supervisor (Professor Kirsten Spencer) was added thereafter. For the studies in this thesis, my contribution was substantial, accounting for at least 80% of the work, where I was responsible for crafting the initial drafts of all the research presented in this project.

In general, as the primary author, I was responsible for reviewing relevant literature, developing hypotheses, designing the studies, obtaining ethical approval, project management, data collection and analysis, writing up the results, and drafting the manuscripts for publication. The role of each supervisor was generally limited to advising and consulting on these various aspects described above, in accordance with normal expectations of a PhD supervisor.

Chapter Three

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Kelly Holt	2.5% Literature & Proofreading		14/9/23

Intellectual Property Rights

There are no intellectual property rights related to this thesis

List of Acronyms

AGM	Annual General Meeting
BPSM	Biopsychosocial Model
CCEA	Council on Chiropractic Education Australasia
CPI	Chiropractic Professional Identity
CPIES	Chiropractic Professional Identity Embodiment Scale
EBM	Evidence-Based Medicine
EFA	Exploratory Factor Analysis
ICC	Intraclass Correlation Coefficient
MMR	Mixed Methods Research
MSK	Musculoskeletal
NMS	Neuromusculoskeletal
NMSK	Non-musculoskeletal
NZ	New Zealand
NZCA	New Zealand Chiropractors' Association
NZCC	New Zealand College of Chiropractic
NZCB	New Zealand Chiropractic Board
NZQA	New Zealand Qualifications Authority
PCA	Principal Component Analysis
PID	Professional Identity Development
PIF	Professional Identity Formation
PROM	Patient Reported Outcome Measure
RCT	Randomised Controlled Trials
SAC	Stakeholders Advisory Committee
SCOP	Scope of Practice
USA	United States of America
VS	Vertebral Subluxation
WFC	World Federation of Chiropractic
WHO	The World Health Organisation

List of Terminology

Biomedical model

A model that posits that manifestation of illness and disease is usually explained by functioning or malfunctioning of internal systems diseases, caused by particular etiological agents such as bacteria, viruses, parasites, genetic abnormalities, or internal chemical imbalances (Berliner, 2022; Rosenberg, 2007).

Biopsychosocial model

This model of health describes the influence of the biological, psychological and sociological factors in the manifestation of pain and illness (Engel, 1977).

Centrist chiropractor

Chiropractic care that incorporates the traditional philosophy of vertebral subluxation focused chiropractic, while also having a practice objective of treatment of general MSK complaints (WFC Task Force Presentation, 2005).

Chiropractic

A healthcare profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health; there is emphasis of manual techniques used such as joint adjustments and/or manipulation, with particular focus on subluxations (World Health Organisation, 2005, p. 3).

Complementary and Alternative Medicine (CAM)

A diverse set of healthcare practices, products, and systems, not considered part of conventional mainstream medicine, rather they are used either alongside or instead of conventional medical treatments, with the aim of promoting health, wellness, and healing. (National Center for Complementary and Integrative Health, 2021).

Mechanist chiropractor

Chiropractic care with an emphasis on musculoskeletal treatment improves dysfunctional joints by mobilisation, which in turn reduces pain and improves function (Schneider et al., 2016).

Professional identity development (PID)

A concept in which professional identity becomes a fundamental way of being, offering a unique perspective through which to assess, acquire knowledge, and gain a deeper understanding of one's professional practice (Trede et al., 2012).

Professional identity formation (PIF)

Involves internalising and demonstrating the behavioural norms, standards, and values of a professional community, such that one comes to “think, act and feel” like a member of that community (Janke et al., 2021).

Vertebral Subluxation

Biomechanical derangements of the spine (as a result of stresses on the body), producing clinically significant maladaptive effects on neurological function and sensorimotor integration (Haavik-Taylor et al., 2010; Henderson, 2012).

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To Dave, I so wish you were here… I know you would've loved this – all that I will say, is that I hope you are keeping your promise, and are watching the kids and I from the stars.

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From the bottom of my heart, thank you all for being there for me in what has been the most chaotic few years. I couldn't have done it without you. With love and gratitude xo

Dedication

To my beautiful kids Sassy, Ollie, and Ziggy.

May this help to show you to keep going, even when it gets tough, and you are not sure of your next steps… you pick yourself up. You put one foot in front of the other. Eventually, you get back on track, you gain some ground, and then the next adventure begins.

I love you.

Ethical Approval

The ethical approval for this thesis was granted by the AUT University Ethics Committee (AUTEC), which was covered by Ethics Application Number **21/166** Contemporary chiropractic identity: *Crystalising practice typologies and outcomes* (see Appendix A1 and A2).

Chapter 1: Introduction - Chiropractic

Prelude

This thesis, titled *Demystifying Contemporary Chiropractic Professional Identity*, seeks to unravel the complexities surrounding the current identity of chiropractors, making it clearer and more accessible to both professionals and the wider community. The term *demystifying* implies removing the confusion that may surround the chiropractic profession and its identity. The goal is to provide clarity and insight into the various factors that shape the professional identity of chiropractors today. By demystifying contemporary chiropractic professional identity (CPI), individuals can gain a better understanding of what it means to be a chiropractor, giving more clarity on the role that the chiropractic profession may play in the healthcare industry. This chapter will examine the historical roots of chiropractic and how it has evolved over time, introduce chiropractic mechanisms of action, and discuss the profession in New Zealand (NZ), where this research was conducted.

1.1 Introduction to the Research

Chiropractors provide care to individuals who have illnesses and physical limitations as well as those who seek to improve their overall health and prevent disease (Blum et al., 2008). Chiropractic assessments involve observing gait patterns, evaluating joints, muscles, and soft tissue tension through palpation, conducting orthopaedic and neurological tests, and utilising additional diagnostic tools such as x-rays and MRI scans (Glucina, 2023). These assessments help identify areas with abnormal structural and neural patterns that can be addressed through chiropractic adjustments, which are sometimes referred to as manipulations (though the terms are not always interchangeable) (New Zealand Chiropractors Association, 2023). In New Zealand, nearly 75% of chiropractors follow an integrative approach tailored to each patient, which includes techniques ranging from classic

dynamic thrusts to low-force methods like cranial work, as well as instrument and table-assisted techniques (Glucina et al., 2021, 2023).

Clinical efficacy studies have established the restorative and therapeutic benefit of chiropractic intervention for functional abilities (Lefebvre et al., 2012; Weigel et al., 2014). While chiropractic is a recognised health profession, policy review suggests a lack of clarity about the role of chiropractic in healthcare (Chang, 2014; Cooper & McKee, 2003; Council on Chiropractic Education Australasia, 2017; Innes et al., 2019).

The lack of resolution regarding fundamental values and direction of the profession creates confusion among stakeholders and poses a threat to the professionalisation and cultural authority of chiropractic (Hartvigsen & French, 2020; Walker, 2016). Within the profession, some argued that this lack of clarity is a result of in-house disagreement relating to professional identity and practitioner subtypes (Leboeuf-Yde et al., 2019). Much academic discourse exists expressing the need to create a shared sense of chiropractic identity to describe what chiropractic is (de Luca et al., 2018; Hartvigsen & French, 2020). Murphy et al. (2008, p.4) noted, "the chiropractic profession must establish a clear identity and present this to society". Yet, no consensus exists on how this unity is able to be achieved (Walker, 2016).

Research on views and attitudes of practicing chiropractors on professional identity is identifiable in Australia (Adams et al., 2017, 2019), the United Kingdom (Jones-Harris, 2010; Pollentier & Langworthy, 2007), South Africa (Myburgh & Mouton, 2007), various countries in the European Union (Ailliet et al., 2010; Gíslason et al., 2019; Humphreys et al., 2010; Malmqvist & Leboeuf-Yde, 2008; Nielsen et al., 2015), and the United States (Lisi et al., 2010; McDonald et al., 2004; Redwood & Globe, 2008; Smith & Carber, 2008, 2009). As yet, there are no published studies available on professional identity from NZ.

The author of this thesis, a chiropractor with over 25 years of clinical experience and 17 years of experience in chiropractic education, observed that the profession-wide infighting was often based on hearsay, relating to professional identity and practitioner subtypes. This provided the catalyst for this thesis project studies. This thesis project will address the lack of knowledge about CPI in NZ.

This research project aims to create a platform to strengthen chiropractic identity, both intra-professionally and within the healthcare arena, locally and internationally. Future implications of this research could raise important research questions and provide both patient and practitioner insights for patient-centred care, therapeutic alliance, patient-reported outcome measure (PROM) selection and instrument development (Adams et al., 2008). Contributions to research fields in the areas of professional identity, chiropractic intervention, outcome measures, therapeutic alliance and pedagogy are anticipated.

1.2 Chiropractic History and Development

The term *chiropractic* is derived from Greek, where *chiro* means *hand* and *praktikos* means *practical* or *done by hand* (Online Etymology Dictionary, 2023). Chiropractic practice was founded on the principles and theory put forward by Daniel David Palmer in Davenport, Iowa in the United States of America (USA), and officially became a profession in 1895 (Palmer, 1910). Palmer coined the phrase vertebral subluxation (VS), which represented his chiropractic theory of a minor misalignment of a vertebra that can cause nerve interference (Senzon, 2018b). Palmer opened the first school of chiropractic in 1897, and many of his early students were medical doctors, osteopaths, homeopaths, and naturopaths. However, as the profession grew, conflicting views emerged, and Palmer's students began to establish their own schools and publish their own textbooks, ultimately leading to division within the profession with conflicting groups (Keating et al., 2004).

The chiropractic field has faced persistent internal conflicts since its inception (Brosnan, 2017; Kent, 2018a; Simpson, 2012). Early on, many of Palmer’s early students, including his son Bartlett Joshua Palmer, who later became a prominent leader and is recognised as the developer of the profession (Palmer College of Chiropractic, 2022), embraced chiropractic as a distinct approach to health (Palmer & Palmer, 1988). However, others viewed it as an adjunct procedure to their medical and osteopathic skills (Peters, 2014). In response, Palmer characterised his approach and beliefs as *straight* chiropractic, while those integrating chiropractic with other procedures with methods from other professions were labelled as *mixed* (Palmer, 1910a, p.80). Palmer believed that mixing would erode the identity of

chiropractic, leading him to develop specific terminology to articulate straight chiropractic philosophy and practice (Palmer & Palmer, 1988).

Straight chiropractic philosophy is often associated with the chiropractor's assessment of VS (Phillips, 2004; Seaman & Soltys, 2013) and excludes any other form of care (Cooperstein & Gleberzon, 2004; Young, 2012).). In contrast, mixers tend to describe chiropractic in medical terms (Johnson, 2010), adopt a more mechanistic approach (Callender, 2007; Hooper, 2005), and use adjunctive treatments alongside chiropractic interventions to focus on MSK issues (Ernst & Gilbey, 2010; Young, 2012). This straight/mixer dichotomy has persisted, leading to ongoing disharmony and even "bullying" within the profession (Brosnan, 2017; Villanueva-Russell, 2011).

These longstanding divisions within the chiropractic profession are further complicated by differing views on vitalism, which plays a crucial role in the ongoing debate over chiropractic identity. Although Palmer alluded to the concept, he did not explicitly use the term *vitalism* (Richards et al., 2017). Often characterised as the idea of an intelligent life force or vital energy within the body (Palmer, 1910a), vitalism is closely associated with the straight chiropractic approach. This approach asserts that adjusting VS restores health by activating the body's innate healing ability (Palmer, 1910a; Richards, 2021; Senzon, 2014).

Today, these ideological differences persist, with one group of chiropractors focusing on evidence-based MSK practice, while others remain committed to the original vitalistic Palmerian philosophy or its variations (Simpson & Young, 2020). These conflicting perspectives are said to contribute to the profession's ongoing struggle to achieve a clear, unified identity (Simpson & Young, 2020). Some chiropractic academics argue that the profession should prioritise evidence-based spine care and the conservative treatment of common MSK disorders (Nelson et al., 2005). In contrast, others argue that incorporating aspects of vitalistic thinking into chiropractic practice could be valuable in addressing the growing burden of non-communicable diseases (Richards et al., 2017), highlighting the ongoing debate within the profession.

Research on chiropractors' views in New Zealand and Australia shows that vitalism remains central to the professional identity of many practitioners (Richards, 2020). However, some chiropractors view vitalism as outdated and unscientific, advocating for a non-vitalistic

approach that focuses on manipulative therapy for MSK pain (Richards, 2020). While Richards (2020) noted that few chiropractors take a neutral stance on vitalism, other researchers suggest the existence of a third group—referred to as the conventional group (Ebrall, 2024) or centrist group (Good, 2010; Leboeuf-Yde et al., 2019)—which lies between the traditional straight and mixer dichotomies.

The chiropractic field has also encountered external conflicts, particularly in its early days as an emerging profession. At a time when chiropractic licensure had not yet been established, mainstream medicine opposed the profession, attempting to implement plans aimed at containing and eliminating chiropractors (Murphy et al., 2008). Thus, chiropractors had no choice but to practice without licenses, and as such many were imprisoned for practicing medicine without a license (Leach, 2004). Numerous legal battles unfolded in the chiropractic field, including a notable case in 1907 involving Dr Morikubo, a graduate of the Palmer School of Chiropractic. He was falsely accused of practicing osteopathy without a license; however, it was successfully argued that chiropractic was a distinct profession with its own unique science, philosophy, and terminology (Rehm, 1986). This ruling helped ensure the continued use of chiropractic language and principles (Rehm, 1986). Following many legal conflicts, the landmark case of Wilk v. American Medical Association (AMA) in 1987 marked a significant turning point for the profession. The outcome of this lawsuit enabled chiropractors to gain licensure, allowed colleges and institutions to obtain accreditation, and ultimately facilitated the growth of the chiropractic field (Johnson & Green, 2021).

By the time of Palmer's death in 1913, the chiropractic profession had formed various associations, had legal precedents from court cases, and chiropractors were practicing worldwide. Currently, in most countries, legal jurisdictions such as legislation exist, and chiropractors are included as having primary care status (e.g., access to a chiropractor does not require a referral from a medical practitioner) and have the requirement and right to perform diagnosis (Erwin et al., 2013; Jones-Harris, 2010).

Throughout the history of chiropractic, various factions have emerged within the profession, each characterised by its own distinct philosophy and practice style. Today, these factions continue to influence the profession. The so-called straights are now frequently referred to as traditional, vitalistic, philosophical, unorthodox, or VS-based chiropractors, while those that Palmer would have described as mixers, frequently identify themselves as orthodox,

progressive, scientific, evidence-based, or condition-based chiropractors (Glucina et al., 2020; Keating et al., 2005; Leboeuf-Yde et al., 2019).

Among all the professional groups within the health sector, the medical profession has wielded the most dominance and power, enjoying significant social, economic, and political advantages over the other groups (Long et al., 2006; Schofield, 2009). The chiropractic profession has also been at the forefront of numerous battles with general medicine (Villanueva-Russell, 2011). These conflicts largely stemmed from the American Medical Associations' (AMA) vocal and growing opposition to non-medical providers such as chiropractors (Johnson & Green, 2021). Whilst the AMA strategy to eliminate the chiropractic profession was ultimately exposed in court, the predominance of mechanistic ontologies in biomedicine and disease continued to rise, also influencing the chiropractic profession (Capra & Luisi, 2014; Crinson, 2010; Villanueva-Russell, 2011).

A mechanistic ontology is a conceptual framework or worldview in which biological and physiological processes are understood as mechanical or causal interactions between parts. This perspective emphasises understanding and treating disease by examining and addressing the underlying physical and biological mechanisms of the body (Anjum & Rocca, 2020). This reductionist approach prioritises disease, pathology, and dysfunction, often at the expense of considering the complexity of the whole person (Anjum & Rocca, 2020; Getz et al., 2011). This mechanistic perspective has also influenced chiropractic practice ideologies, with some chiropractors advocating for the elimination of metaphysical vitalism (Leboeuf-Yde et al., 2019; Nelson et al., 2005; Reggars, 2011). These proponents argue that discarding chiropractic terminology, such as VS and vitalistic concepts, would allow the profession to align more closely with dominant mechanistic, biomedical, and biopsychosocial models (BPSM), thereby enhancing its credibility and prestige (Johnson & Green, 2021; Walker, 2016).

The concept of VS has been a longstanding source of controversy in chiropractic, due to limited experimental evidence, fuelling scepticism among the scientific community and creating uncertainty within the profession (Keating et al., 2005). It is argued that, without the concept of VS and its related philosophy, chiropractors would simply be physical therapists who utilise spinal manipulation (Hart, 2016). On the other hand, chiropractors in the non-VS camp emphasise the importance of MSK care to treat back pain (Stochkendahl et

al., 2019). This group also espouses that a CPI must align and confirm with widely accepted and acknowledged concepts of disease and health which includes adopting terminology and language that is shared with other healthcare professionals (Simpson & Young, 2020).

Due to the diverse practice styles and beliefs within the chiropractic profession, an ongoing debate persists regarding the optimal path to shape its future. Some even propose the possibility of a split within the profession (Brosnan, 2017; Leboeuf-Yde et al., 2019), highlighting the depth and intensity of the discussion. Central to the debate are controversial aspects of chiropractic philosophy, such as VS and practice styles on professional identity. A deeper understanding of CPI, as explored in this thesis and future research, may provide valuable insights to help the profession navigate its future trajectory.

1.3 Chiropractic Mechanisms

Chiropractic care has undergone significant evolution since its inception, driven by advancements in neuroscience that have led to a revised understanding of the mechanisms by which it contributes to improved health (Peck, 2013). Initially, chiropractic theory posed that misaligned spinal vertebra was responsible for various ailments, and once corrected through chiropractic adjustments, alleviated a patient's symptomology (Palmer, 1920). Despite years of debate over the definition of chiropractic, it is fair to say that the profession still has a long way to go in fully understanding the nature of VS, let alone achieving universal agreement.

The profession's unique traditional clinical approach centres on the VS (Henderson, 2012; Senzon, 2018a). Put simply, VS may be seen as being analogous to the *somatic dysfunction*, *spinal dysfunction* or *osteopathic lesion*, and can be likened to manipulable spinal lesions in the physical medicine literature (Fryer, 2016). Recent research investigating the mechanisms of chiropractic subluxation have undergone a shift with advances in neuroscience. The focus has moved from a local structural pathology model, which posited that subluxation directly impacted spinal nerve roots or the spinal cord itself (Grostic, 1988; Stephensen, 1927), towards a more central neuroplasticity model (Boal & Gillette, 2004; Gyer et al., 2019; Haavik & Murphy, 2012). According to this model, VS/spinal dysfunction is considered a

biomechanical derangement of the spine that produces clinically significant effects on neurological function (Henderson, 2012).

Haavik & Murphy (2012) proposed that spinal dysfunction or VS can lead to altered neurological afferent input, consequently inducing distorted central plastic changes within the brain. These changes may lead to compromised sensorimotor integration, pain, dysfunction, and associated symptoms. The application of high-velocity, low-amplitude chiropractic adjustments to spinal dysfunction or subluxations, could potentially reinstate normal afferent input by influencing muscle spindles. This influence could result in improved sensorimotor integration and proper function (Haavik, et al., 2021; Navid et al., 2019), the impacts of which can affect various systems, including neuro-immune function (Haavik,et al., 2021).

Over the past two to three decades, various efforts have been made to elucidate the nature of VS, resulting in numerous consensus statements and definitions. One of the latest consensus definitions, formulated by the Rubicon Group in 2017, posits that VS is neurologically based with altered vertebral joint motion that leads to ongoing maladaptive neural plastic changes, disrupting the central nervous system's ability to self-regulate, self-organize, adapt, repair, and heal (Clum & Rubicon, 2017). Several researchers have suggested that joint dysfunction and changes in intervertebral motion, components of VS, lead to altered afferent input to the central nervous system. This, in turn, affects how the central nervous system processes and integrates sensory input (Haavik-Taylor et al., 2010; Henderson, 2012; Holt, 2014). Altered afferent input from spinal joints has been linked to synaptic changes in the spinal cord, variations in sensory thresholds, and modifications in reflex excitability (Bakkum et al., 2007; Henderson, 2012).

Within the chiropractic profession, a spectrum of perspectives exists regarding subluxation and its role in chiropractic practice (Glucina et al., 2020). While some chiropractors exclusively focus on VS, others argue against the existence of VS altogether (Good, 2016; Simpson, 2012). This voice within the profession, advocate for removing the concept from the chiropractic lexicon, asserting its lack of causal effect on health or disease aetiology (Huijbregts, 2005; Mirtz et al., 2009; Simpson, 2012). Instead, chiropractic manipulation is regarded as a therapeutic approach for addressing back pain and MSK disorders. Its

mechanism involves influencing receptors within joint ligaments, capsules, and fascia, providing input to critical neural circuitry responsible for spinal stability (Henderson, 2012).

Scientific investigation has revealed notable impacts of chiropractic care on the pre-frontal cortex, contributing to enhanced communication between the brain and body (Lelic et al., 2016). This may explain the potential beneficial effects of chiropractic intervention on both non-musculoskeletal (NMSK) (e.g., visceral disorders or neuroimmune responses) and MSK disorders (Haavik et al., 2021a, 2021b; Hawk et al., 2007). Several studies have documented improvements in a range of pain syndromes following chiropractic care (Chu et al., 2023; Espí-López et al., 2017; Haas et al., 2010; McDonald et al., 2011; McMorland et al., 2010; Stochkendahl et al., 2019; Thorman et al., 2010; Wilkey et al., 2008).

Research has also explored the impact of the VS on the functional role of the nervous system in health (Andrew et al., 2017; Baarbé et al., 2016; Holt et al., 2011, 2019; Lelic et al., 2016; Navid et al., 2019). Additionally, chiropractic care has shown to improve quality of life (Holt et al., 2011; Kent, 2002, 2018b; Khauv & John, 2011; Lelic et al., 2016). Despite differing philosophical beliefs and practice orientations, chiropractors work with a diverse range of patient groups, and patients typically report a high level of satisfaction with the care that they receive (Davis & Bove, 2008; Gaumer, 2006; MacPherson et al., 2015; Rowell & Polipnick, 2008; Weigel et al., 2014). Gaining a broader understanding of CPI and its conceptual frameworks may help to reduce confusion surrounding the profession and its place in healthcare.

1.4 The Chiropractic Profession

The controversy surrounding the chiropractic profession, on practitioner ideologies and practice approaches, has not only sparked debates within the profession but has also had internal political implications. In 2017, the International Chiropractic Education Collaboration (ICEC), for instance, issued a position statement recommending that chiropractic programmes only teach about VS solely in a historical context, asserting that VS and related concepts are unscientific and should not be included in modern education (Funk et al., 2018). This consortium, comprising 17 chiropractic institutions and 2 chiropractic unions,

with a steering group of three members from the UK and Denmark, advocates for a focus on MSK issues. The ICEC education position statement aligns with and supports the themes presented in the World Federation of Chiropractic's Educational Statement, formulated during the 2014 Miami Education Conference (University of Southern Denmark, 2023).

However, this stance contradicts the current state of clinical programmes. In the United States alone, 18 chiropractic college programmes still predominately feature VS in their college catalogues, in technique course descriptions, principles and practices descriptions and in other course descriptions, and these programmes account for 88% of programmes in the USA (Funk et al., 2018). Similar findings were reported in a previous study of North American English-language chiropractic programmes conducted by Mirtz and Perle (2011).

The World Federation of Chiropractic (WFC), which includes the majority of chiropractic associations worldwide, is a non-governmental organisation that has had official relations with the World Health Organisation (WHO) since 1997 (World Federation of Chiropractic, 2012). Globally, chiropractic is one of healthcare's fastest growing professions and is the third largest form of healthcare in the United States (National Board of Chiropractic Examiners, 2023). The WHO defines chiropractic as "a healthcare profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal (NMS) system and the effects of these disorders on general health; there is emphasis of manual techniques used such as joint adjustments and/or manipulation, with particular focus on subluxations" (World Health Organisation, 2005, p.3).

Over the past 50 years, chiropractic has successfully met the statutory requirements of a health profession, and has gained formal recognition by government bodies, achieving insurance equivalence, and garnered increased acceptance within the healthcare industry (Chapman-Smith, 2000; Jolliot, 2012; Peck, 2013). Despite these accomplishments, chiropractic is still largely excluded from public health systems and remains underrepresented in discussions about healthcare delivery on a global scale, leading chiropractors to continuously defend their professional standing (Brosnan, 2017; Rosner, 2016). Some chiropractors attribute this lack of integration to the profession's lack of a cohesive professional identity (Gíslason et al., 2019; Gliedt et al., 2015; Leboeuf-Yde et al., 2019; Simpson & Young, 2020).

Much of this conflict stems from the differing conceptual frameworks or ontologies of medicine and chiropractic. This disagreement arises from their fundamentally different perspectives on health and disease: conventional medicine is grounded in a biomedical framework (Baars & Hamre, 2017; Bynum & Porter, 2013), whereas chiropractic care often incorporates holistic principles (Rosner, 2016). Historically, the medical profession viewed chiropractic as quackery as medicine was marketed by the AMA to be the only legitimate source of healthcare (Johnson & Green, 2021). Indeed, this feud has continued into recent decades of debate where Complementary and Alternative Medicine (CAM) providers and practices have been called quacks or that their basis is pseudo-science (Brosnan & Cribb, 2019).

Within the international landscape, the chiropractic profession has a global registry of over 100,000 practitioners, spanning across 90 countries, with the majority located in high-income nations (Stochkendahl et al., 2019). The USA holds the highest chiropractor-to-population ratio, with 23.7 chiropractors for every 100,000, with the lowest ratio found in India, with only 0.0007 chiropractors per 100,000 people (Stochkendahl et al., 2019). Shifting focus to Australia, as of 2023, there are approximately 6300 practicing registered chiropractors (Chiropractic Board, AHPRA., 2023), while the weekly count of Australians seeking chiropractic care surpasses 300,000 (Australian Chiropractors Association, 2023).

Chiropractors employ a range of diagnostic methods, which include obtaining a patient's history and performing physical, orthopaedic, and neurological assessments and examinations (Meeker & Haldeman, 2002). The management of patients and clinical practices in chiropractic is highly diverse and can differ significantly among practitioners. This diversity encompasses various aspects such as conceptual understanding to the types of combinations of treatment interventions and approaches utilised (Walker, 2016).

1.5 The Chiropractic Profession in New Zealand

In 1978, the NZ government established a Royal Commission of Inquiry to thoroughly examine the field of chiropractic. This comprehensive investigation, lasting over 2 years, looked into every facet of the industry and included input from the Department of Health,

the New Zealand Consumer Council, and the Medical, Physiotherapy, and Chiropractic Associations of New Zealand. The report's conclusions acknowledged chiropractic as a "soundly-based and valuable branch of health care in a specialised area" (Commission of Inquiry into Chiropractic, 1979, p.2). The commission report was well-regarded on a global scale for its in-depth analysis of the chiropractic profession and served as the basis for government regulations in multiple countries. Following the AMA's unsuccessful attempts to discredit chiropractic, globally, the profession received a significant boost from the NZ Royal Commission report, which established chiropractic as a legitimate and essential part of the healthcare landscape. (Dew, 2001; Senzon, 2018b). As a result of this pivotal event, chiropractic has experienced a sustained period of increasing international acceptance and growth (Glucina et al., 2021).

Following the recommendation of the commission's report that a local educational programme be formed, the New Zealand College of Chiropractic (NZCC) was founded in 1994 (New Zealand College of Chiropractic, 2023). Accreditation of the NZCC was granted by the NZ Qualifications Authority (NZQA) in 1997 and the Council on Chiropractic Education Australasia (CCEA) in 2002. Since its inception, the NZCC has successfully graduated over 950 chiropractors who are qualified to practice internationally (Glucina et al., 2021). As of 2021, there were 728 active chiropractors in NZ (New Zealand Chiropractic Board, 2021), delivering healthcare to the country's 5.1 million residents (StatsNZ, 2023).

To gain further insights into typical practice in NZ, the NZCC regularly commissions surveys through the Stakeholders Advisory Committee (SAC) to monitor the profession's needs and gather information to assist in programme development. The latest SAC survey in 2022 revealed that 42% of patients received care for symptomatic relief, 35% for wellness care, and 16% for preventative care (Glucina, 2023). According to the survey, adults accounted for 33% of weekly practice visits, followed by older adults at 23.5%, teens at 13.5%, and children under 12, who made up 30% of the visits.

Questions from the NZ SAC Survey reveal a range of practice ideologies (guiding beliefs that inform practitioners' care) within the NZ chiropractic profession: 16% of respondents disagreed or strongly disagreed, 11% remained neutral, and 73% agreed that the primary purpose of the chiropractic examination is to detect VS (Glucina, 2023). Despite these

differing practice views, the profession remains largely united, with the concept of VS being well-established and widely acknowledged (Glucina, 2023; New Zealand Chiropractors Association, 2023). The unity observed in NZ could serve as a model for other countries to achieve similar cohesion within the profession.

To address the diversity of chiropractic practice approaches, prioritising a clearer understanding of CPI is essential. By fostering enhanced understanding and communication about the profession's identity, both collective organisations and individual practitioners can effectively educate communities about chiropractic and its role within the broader healthcare landscape. This, in turn, will empower patients to make informed decisions and gain a better understanding of the various practice approaches and their potential benefits.

1.6 Chapter Summary

There is a lack of clarity about the role of chiropractic in healthcare, which may be due to in-house disagreement relating to professional identity and practitioner subtypes. While chiropractic has been established as a recognised health profession with clinical efficacy studies that demonstrate its therapeutic benefit, there is still no consensus on how to achieve a shared sense of CPI. To date, there are no published studies on chiropractors' perspectives on professional identity and practitioner subtypes in NZ.

Chiropractic care employs various diagnostic methods and treatment interventions, such as chiropractic adjustments, to manage MSK and NMSK disorders, improve quality of life and enhance the way in which the brain and body communicate. The brief history of chiropractic practice demonstrates there has been persistent internal identity conflicts almost from inception that has led to division within the profession with conflicting groups. The traditional straight clinical approach of chiropractic focuses on VS, which may cause biomechanical derangement of the spine that produces clinically significant effects on neurological function. While some chiropractors exclusively focus on VS, others argue that VS do not exist, and that chiropractic manipulation is seen as a therapeutic approach for treating back pain and MSK disorders by influencing receptors in joint ligaments, capsules, and fascia that provide input to critical neural circuitry responsible for stabilising the spine.

In 1978, a Royal Commission of Inquiry in NZ recognised chiropractic as a legitimate healthcare speciality, and its report played a pivotal role in shaping government regulations in other countries. However, the chiropractic profession faces challenges due to the existence of diverse philosophical approaches and practice styles within NZ and internationally. This diversity can lead to confusion and hinder a unified approach within and outside the profession. To address this issue, it is imperative for the chiropractic profession to proactively develop a clearer understanding of its identity. By doing so, the profession can effectively minimise confusion, foster better communication, and work towards a more cohesive and unified future.

Chapter 2: Introduction - Exploring the Concept of Professional Identity

Prelude

Understanding professional identity is essential for comprehending the behaviours and actions demonstrated by members of various professions in different environments. However, to delve into the exploration of professional identity within the context of chiropractic, it is necessary first to analyse its semantic components and diverse aspects. Notably, identity is inherently linked to social identity and is shaped by individual, cultural and social contexts.

In this thesis, the term "framework" refers to a structured lens through which practice ideologies, paradigms, and approaches—or other relevant concepts—are applied. Practice ideologies refer to the guiding beliefs that inform practitioners' care, while paradigms represent overarching systems of thought that shape the profession's core principles. Approaches, on the other hand, involve the practical application of these ideologies and paradigms within clinical settings.

Within the field of chiropractic, the profession can encompass a range of frameworks within the broader healthcare landscape, contingent on each chiropractor's standpoint. These frameworks may include biomedical, complementary, alternative, and integrative medicine, as well as patient-centred paradigms. Each of these approaches hold prominence within the realm of health professions, and it is essential to further explore their nuances and implications.

The primary objective of this chapter is to provide a more comprehensive explanation of the nuances of professional identity concepts and to shed light on the research aims, methodology and the researcher's positioning within this thesis. Additionally, the structure and organisation of the thesis will be clarified, aiming to offer a coherent and cohesive

understanding of the subsequent sections. By doing so, a solid foundation can be laid for the in-depth examination of CPI and its broader implications in the healthcare landscape.

2.1 Professional Identity

A myriad of definitions and conceptual frameworks exist for both professional and identity. While the construct of professional identity has been extensively utilised in academic literature, obtaining a uniform definition presents a challenging prospect (Wilkinson et al., 2016). To gain further understanding of professional identity, a foundational grasp of its individual semantic components is required. Historically, a profession has been associated with a group of individuals sharing a distinct body of knowledge requiring specialised education, training, skills, and experience for their intellectual or artistic endeavours (Abbott, 1988; Evetts, 2003, 2006). The term professional can encompass various meanings, ranging from describing a person's behaviour or their control of expert knowledge, to definitions that emphasise the role and authority of specific areas of expertise or that define a person's identity in their particular profession (Abbott, 1988; Wilkinson et al., 2016).

Identity, being dynamic, is moulded by personal, ethnic and national contexts, that is also socially constructed over time, shaped by individual interactions or group affiliations within society. Identity can also be viewed from multiple philosophical and theoretical perspectives such as Social Identity Theory (Hogg, 2016; Tajfel, 1974). Social Identity Theory underscores the importance of group membership in shaping individual identity and behaviour, and how group dynamics can impact intergroup relations. Vignoles et al. (2011) adopt an integrative approach, defining identity as a response to questions of self and others, rooted in individual, interpersonal, or group/societal contexts.

Sociologists and psychologists have explored professional identity for decades (Abbott, 1988; Goode, 1960; Saks, 2012). Broadly, the concept appears to encapsulate a type of identity linked to how professionals perceive themselves and their work (Adams et al., 2006; Hotho, 2008; Skorikov & Vondracek, 2011; Tan et al., 2017). Situated within one's social identity, professional identity, nurtured through professional socialisation, provides a sense of belonging, stability, and self-worth (Hotho, 2008). Professional identity is closely intertwined with social identity and may begin formation during training and evolves throughout one’s

working life (Goldie, 2012). Professional identity or work identity may be defined as an individual's self-concept in relation to their profession or occupation (Slay & Smith, 2011).

Career, integral to individual identity, is marked by its temporal commitment, social framework, and financial importance (Illeris, 2014), particularly in fields like healthcare where professional identity intertwines with core identity (Partington, 2017). The construct of professional identity is shaped at the macro-level (e.g., by the profession's self-perception), but and also the micro-level (shaped by membership criteria) (Wackerhausen, 2009) and permeates organisational dynamics, managerial efficacy, healthcare system reforms, and interprofessional responsibilities (Alvesson & Willmott, 2002; Joynes, 2018). The ramifications of professional identity are diverse, influencing professional development, commitment, engagement, and leadership (Alvesson et al., 2008; Dobrow & Higgins, 2005; Kim et al., 2012).

Regarded as a cornerstone for safe and effective clinical practice in the health professions (Matthews et al., 2019), professional identity has been extensively investigated in diverse healthcare realms. These include pharmacy (Noble et al., 2014, 2015), counselling (Prosek & Hurt, 2014; Weinrach et al., 2001; Woo & Henfield, 2015), social work (Wiles, 2013), nursing (Hoeve et al., 2014; Moola, 2017; Worthington et al., 2013), occupational therapy (Ashby et al., 2016; Edwards & Dirette, 2010; Whitcombe, 2013), physiotherapy (Hammond et al., 2016; Lindquist et al., 2006) and medicine (Cruess et al., 2014, 2019; Lane, 2018).

Professional identity exists along a continuum, developing in a non-linear fashion with periods of progression and regression at different times (Cruess et al., 2019; Monrouxe, 2016). Recent research shows that a strong professional identity has been linked to improved patient outcomes (Walder et al., 2022), aligning with the core objectives of health professions. Additionally, studies have demonstrated that a well-developed and adaptive professional identity also contributes to the resilience and wellbeing of clinicians themselves (Chandran et al., 2019; Cullum et al., 2020). Consequently, delving into and deepening the comprehension of professional identity, particularly within the chiropractic profession and the context of New Zealand, holds paramount importance.

2.2 Divergent Perspectives on Health

Healthcare professionals, such as physicians, osteopaths, physiotherapists, manual therapists, obstetricians, and midwives, have reported limited knowledge of chiropractic treatments and the profession itself (Langworthy & Smink, 2000; Mullin et al., 2011; Salsbury et al., 2018; Weis et al., 2016; Wong et al., 2013). Consequently, this limited knowledge can lead to misperceptions about chiropractic. Furthermore, patients tend to associate chiropractors with treating MSK conditions such as back pain, muscle and joint pain, and headaches, while the effectiveness of chiropractic treatments for other health conditions is supported to varying degrees (Cambron et al., 2007). Views on chiropractic and what it can offer may differ between the patient, public layperson, healthcare worker and practitioner.

Health systems are encouraged to prioritise health policies that underscore healthcare services aimed at enhancing overall functioning (Stucki et al., 2017). While care for NMSK conditions has demonstrated positive outcomes (Dougherty et al., 2012; Hawk et al., 2007; Holt et al., 2019), recent systematic reviews have revealed insightful findings. A systematic review of randomised controlled trials (RCTs) from Tsertsvadze et al., (2014) found that chiropractic interventions were both less costly and more effective than GP and other forms of care for managing neck, low back and shoulder pain or disability. Several other reviews and studies report on the cost effectiveness of chiropractic care (Dagenais et al., 2015; Stochkendahl et al., 2016; Weeks et al., 2016). However, a lack of awareness persists concerning the potential influence of chiropractic interventions in reducing pain and improving overall well-being and quality of life (Hays et al., 2020; Jensen, 2016).

Non-invasive and non-pharmacological approaches to MSK and NMSK conditions are expected to gain greater legitimacy and are increasingly recommended (Skelly et al., 2018; Tick et al., 2018). A 2018 review published in the *Journal of Family Practice* highlighted evidence-based recommendations recognising techniques, such as spinal manipulation, as significant interventions in managing chronic conditions (Lemmon & Hampton, 2018). Despite a knowledge gap among some healthcare professionals in the potential role of chiropractic care, chiropractors continue to play a key role (Maiers et al., 2018; Murphy et al., 2022; Redwood & Globe, 2008) within the healthcare system with approximately 9% of

the global population utilising their services (Beliveau et al., 2017). This figure has the potential to increase as awareness and understanding of the profession continue to grow (Maiers et al., 2018; Murphy et al., 2022). Nevertheless, this limited understanding and recognition from other medical disciplines can hinder chiropractors' esteem and their ability to collaborate effectively with fellow healthcare providers (Myburgh et al., 2022), as well as effectively communicate chiropractic concepts to their patients (Glucina et al., 2019).

It is not surprising that there is widespread speculation and conjecture about how to classify chiropractic within the broader healthcare landscape given the conflicting opinions within the field of chiropractic. Some chiropractic professionals consider that as a holistic whole-person approach, the chiropractic profession lies within the CAM field (Kelner et al., 2006; Lawrence & Meeker, 2007; Redwood & Globe, 2008). Others purport that chiropractic sits within a biomedical treatment approach to provide symptom relief (Gotlib & Rupert, 2008).

These wider groupings themselves could influence one's professional identity due to the underlying beliefs and claims of the epistemological basis of both illness and health. For example, the biomedical approach to diseases relies on external scientific evidence and relieves patients from comprehensive moral responsibility for their conditions, while the resurgence of CAM reinstates the importance of the patient's subjective experience as the primary source of knowledge and restores a sense of moral agency (Roichman, 2022; Saks, 2015). The information that follows will summarise these wider healthcare approaches.

2.2.1 Complementary and Alternative Medicine

Complementary and Alternative Medicine refers to a diverse set of healthcare practices, products, and systems that are not considered part of conventional mainstream medicine. These approaches are used either alongside, or instead of, conventional medical treatments, with the aim of promoting health, wellness, and healing. Complementary and Alternative Medicine encompasses a wide range of modalities, such as herbal medicine, acupuncture, chiropractic, naturopathy, homeopathy, and mind-body practices like meditation and yoga (Department of Health and Human Services., 2023).

Throughout history, CAM has been characterised by its subordinate position in relation to mainstream healthcare, with CAM practitioners occupying a marginal position in the occupational division of labour (Saks, 2015). From a sociological perspective, conventional medicine is considered to be healthcare supported by the state, currently dominated by biomedical approaches and primarily centred on pharmaceuticals and surgical interventions (Le Fanu, 2011). Conversely, CAM is seen as comprising therapies that are generally not endorsed by the state and are currently largely subservient to biomedicine (Saks, 2015).

Whilst CAM encompasses a diverse range of professions, the professionalisation of the CAM domain has been accompanied by a growing demand for it to establish a scientific basis for its practices, leading CAM to seek access to research facilities and credibility available through universities (Brosnan & Cribb, 2019). However, since most CAM approaches are not based on the biomedical model, there are difficulties in generating evidence that can be readily integrated into evidence-based medicine frameworks, as noted by Barry (2006) and Brosnan (2016). The popularity of CAM has been increasing, with growing demand for this approach.

It should be noted that, recently, there has been a movement towards renaming CAM to CAIM to include integrative health. Complementary, alternative and integrative medicine (CAIM) refers to non-mainstream methods that are utilised either in conjunction with, as substitutes for, or in coordination with conventional medicine (National Center for Complementary and Integrative Health, 2021).

2.2.2 The Biomedical Approach

The biomedical model has its historical roots in ancient Greece with the physician Hippocrates who advocated for the observation of natural phenomena (Valles, 2020). Hippocrates emphasised the importance of clinical examination and empirical evidence in understanding and treating diseases, with the underlying belief being that nature was the source of healing and the job of the physician was to aid nature in the healing process (Ghaemi, 2008). The biomedical model gained momentum during the Renaissance and Enlightenment periods, emphasising scientific inquiry, anatomy, and empirical evidence (Willis & Elmer, 2007). The 19th-century germ theory founded by Louis Pasteur, solidified the

biomedical model's emphasis on identifying specific disease-causing agents and finding targeted treatments (Smith, 2012). By the 20th century, the biomedical model became dominant in Western medicine, centering on biological and physiological aspects of illness, using scientific evidence for diagnosis and treatment (Willis & Elmer, 2007).

An important development in biomedicine is the rise of Evidence-Based Medicine (EBM) (Au, 2021). Over the past two decades, a substantial body of literature reporting on evidence to the approach of EBM has emerged, demonstrating improved patient outcomes. However, the sheer volume of evidence makes it challenging for clinicians to consistently review primary research (Greenhalgh et al., 2014). To mitigate this, clinical practice guidelines have been created to provide "pre-processed" evidence-based recommendations, streamlining the application of EBM in daily practice (Djulbegovic & Guyatt, 2017). Despite this, a recent Australian study found that local guidelines often lack recommendations based on high-quality evidence, a problem likely prevalent across many medical fields (Venus & Jamrozik, 2020). Additionally, there are concerns about institutional corruption within pharmaceutical companies, which can result in practices not always being evidence-based (Jureidini & McHenry, 2022; Light et al., 2013). It is also argued that entire medical subspecialties, treatments, and preventive measures may sometimes be founded on minimal evidence (Prasad et al., 2012).

Although the biomedical model provides various explanations for the occurrence of diseases, it has been criticised for its inability to comprehend the fundamental origins of illnesses (Roichman, 2022). The biomedical model posits that diseases are solely caused by particular etiological agents like bacteria, viruses, parasites, genetic abnormalities, or internal chemical imbalances (Berliner, 2022). The body is conceptualised as an integrated set of chemical, physiological and biological, systems, while the manifestation of illness and disease is usually explained by functioning or malfunctioning of these internal systems (Rosenberg, 2007). As a result, malfunctions or diseases are not typically attributed to an individual's actions; rather, there is a prevailing belief that many illnesses are considered random and unpredictable (Luhrmann, 2007).

It must be acknowledged that biomedicine encompasses a diverse range of philosophical perspectives; Within the biomedical framework, variations exist, and some argue that the model is insufficient in providing moral and agentive meaning regarding the occurrence of

illnesses and diseases (Roichman, 2022). However, contemporary medical professionals, particularly those managing chronic illnesses, often advocate for patients to take control of their health through lifestyle choices such as exercise and diet (Abe & Abe, 2019; Valenzuela et al., 2021; Vodovotz et al., 2020). Additionally, the influence of the potential impact of the mind on the body, particularly through stress, has long been acknowledged (Abe & Abe, 2019; Bircher, 2005; Cooper & Marshall, 1976).

Despite this recognition, the practical emphasis in medical care continues to lean heavily on pharmacological interventions. In 2016, drug prescriptions were involved in 74% of physician office visits in the United States (National Centre for Health Statistics, 2017), highlighting the dominance of medication in treatment plans. Similarly, in Australian general practice in 2016, although 62% of patients were overweight or obese, advice on weight and nutrition was given in only 3% of consultations, and healthy lifestyle advice was offered in just 6% of encounters (Britt et al., 2015). This gap between acknowledged best practices and actual medical treatment reveals the ongoing reliance on drugs over lifestyle changes in addressing health issues.

2.3 Where does Contemporary Chiropractic Fit?

Despite the limitations of EBM (Jureidini & McHenry, 2022; Light et al., 2013; Prasad et al., 2012; Venus & Jamrozik, 2020), it remains an indispensable component of clinical practice (Hoffman et al., 2024; Howick, 2011). A cornerstone of EBM is the hierarchical system of classifying evidence known as the levels of evidence (Burns et al., 2011), with RCTs representing a high standard of evidence (Collins et al; 2020; Mackenzie & Grossman, 2005). As healthcare systems place greater emphasis on EBM, chiropractors, policymakers, administrators, and other healthcare providers are recognising the importance of using patient-focused evidence and instruments to measure performance and outcomes (Hawk et al., 2007). A strong trend exists where EBM is considered the most important scientific research to evaluate treatment efficacy (Barry, 2006). However, some critics argue that a rigidity exists within EBM as this system is not always patient-centred (Greenhalgh et al., 2014), and that RCT designs may not be suitable for all research questions, including some

relevant to chiropractic care (Mackenzie & Grossman, 2005; Rosner, 2012; Rycroft-Malone et al., 2009).

Whilst it has been argued that the chiropractic therapeutic approach is fundamentally reductionistic (Hawk, 2006), the underlying philosophical concepts of chiropractic are rooted in a patient-centred approach to care (Davis & Bove, 2008; Gatterman, 2006; Jamison, 2001). Stewart et al. (2000) have suggested that the concept of a patient-centred approach can be traced back to the time of the ancient Greeks. Since then, it has continued to evolve, and recently attributed to Balint (in the 1950s), who emphasised the importance of considering patient individuality in the assessment and understanding of a patient's complaints rather than simply focussing on underlying pathology (Duggan et al., 2006; Mead & Bower, 2000, 2002; Van Dulmen, 2003).

Patient-centred care necessitates the practitioner to empower the patient, share in the power relationship and consider the entire individual and the interaction between mind and body (Stewart et al., 2013). Patient-centred care has also been characterised by factors of preference, availability, appropriateness and timeliness (Berry et al., 2003). In a paradigm popularised by Engel, the patient-centred approach is said to address the need to contextualise the presenting symptoms of the patient to consider the physical, mental and social dimensions, while concurrently engaging the patient in their care (de Haes, 2006; Engel, 1977; Mead & Bower, 2000).

Within chiropractic, a lack of clarity exists as to what model or framework is the most suitable for patient care (Lady et al., 2018). A shift is said to be advocated away from treatment of disease, towards patient care, that offers a therapeutic alliance between patient and practitioner (Lambers & Bolton, 2016). Regardless of the epistemological views held by individual chiropractors, the biopsychosocial model is widely regarded as a valuable framework (Gliedt et al., 2017; Innes et al., 2015). This is primarily because it emphasises the significance of establishing a strong patient-provider relationship through understanding and involving the patient in their care (Jolliot, 2012).

The biopsychosocial model (BPSM) of health, introduced over 50 years ago, emphasises the interplay between biological, psychological and social factors in the manifestation of pain and illness (Engel, 1977). This model remains the predominant framework in healthcare

today (Bolton, 2022, 2023; Ghaemi, 2009). However, its implementation in clinical practice can be challenging and is sometimes overlooked or considered impractical due to its comprehensive nature (Astin et al., 2006; Lane, 2014; Nadir et al., 2018). Built on systems theory, the BPSM suggests that practitioners consider biological, behavioural/ psychological, and social forces in patient health and illness (Cohen et al., 2000). It has been suggested that the patient-practitioner relationship and their communicative behaviours may influence outcomes of care, both in the short and the long term (Kelley et al., 2014; Ong et al., 1995). This model is being embraced by some chiropractors (Gliedt et al., 2017; Innes et al., 2015), and the WFC has incorporated the BPSM into its definition of chiropractic care, emphasising the mind-body relationship in health (World Federation of Chiropractic, 2009).

To conclude, the limited knowledge of chiropractic among healthcare professionals can lead to misperceptions about the profession and its effectiveness. Moreover, the conflicting opinions within the chiropractic field about its classification within the broader healthcare landscape raise questions about the professional identity of chiropractors. This highlights the importance of establishing a clear professional identity in healthcare, which not only helps practitioners to collaborate effectively but also enables patients to understand the roles and contributions of different healthcare providers.

2.4 Research Methodology Used

The overall goal of this PhD project is to develop the understanding of chiropractic identity for both individual practitioners and the profession. This project seeks to understand the current status of contemporary CPI and will examine the components of CPI and, through this, create a definition to then inform and develop CPI survey items. The information gathered from this project will be used to create a psychometrically robust professional identity scale for chiropractors and chiropractic students.

Given the limited research available on measuring CPI, this study draws on research from the counselling profession to inform its methodology. Woo (2014) developed the Professional Identity Scale in Counselling (PISC) to examine the identity of counselling professionals, and this instrument serves as the basis for measuring professional identity in the present study.

The PISC has been employed in various settings, including with practicing counsellors (Woo & Henfield, 2015), in career counselling (Littlefield, 2016), and in adapted form to assess the professional identity of American Sign Language/English interpreters (Harwood, 2017).

This research project will adopt a post-positivist perspective, which emphasises naturalistic inquiry and the importance of understanding realities in their natural setting (Clark, 1998; Guba & Lincoln, 1982). To gain a more comprehensive understanding of the under-researched topic at hand, after gaining a deeper understanding from an extensive literature review, both qualitative and quantitative methods will be used. The combination of findings from these two methodological paradigms may generate new insights (Hesse-Biber, 2010; Lingard et al., 2008). Mixed methods research (MMR) is particularly useful when examining several related questions, making it a valuable tool in health disciplines (Mengshoel, 2012).

To achieve the goals of this project, a sequential MMR of exploratory design will be employed. The initial stage will involve collecting and analysing qualitative data, which will then inform the subsequent stage of quantitative data collection and analysis. This design allows for a more thorough investigation of the topic, as the qualitative data can provide insights into the research questions that can then be tested with quantitative methods.

In research involving qualitative approaches, the positioning of the researcher holds significant importance (Malterud, 2001; Sutton & Austin, 2015). In this study, the researcher is a chiropractor with 25 years of clinical experience, actively engaged in teaching and administration at the NZCC. Throughout their chiropractic journey, the researcher became acutely aware of the division in chiropractic philosophy, a divide that became evident during their undergraduate training. To the researcher, this conflict appeared counterproductive and seemed to undermine the confidence of individual practitioners in their professional identity.

As the years passed, the question regarding the different views on the profession's professional identity remained unanswered by academics: Does this divide impact the professional identity of the profession? This unanswered question served as the driving force behind the initiation of this research project, seeking to understand and explore the identity of the chiropractic profession and for individual practitioners.

2.5 The Research Questions

Based on the considerations raised from this chapter, the research questions are as follows:

1. What is the current understanding of CPI among practicing chiropractors?
2. What are the key components that constitute a definition of CPI?
3. What themes and items would need to be represented in the development of an initial measurement scale on the construct of CPI?
4. Can a measurement scale, including potential composite subscales, be developed to operationalise CPI, and what are the psychometric properties?
5. Are there any differences among potential subgroups in composite scores of the CPI scale?

The main objective of this PhD project is to enhance the comprehension of chiropractic identity, encompassing both individual practitioners and the profession as a whole. The project aims to explore the existing state of contemporary CPI, dissect its components, and ultimately formulate a precise definition. This definition will serve as the foundation for developing a comprehensive set of survey items, that will be field tested for reliability and validity. This scale will be developed to benefit both chiropractors and chiropractic students in assessing their sense of professional identity.

2.6 Significance of the Study

The purpose of this thesis research is to help to develop a clearer understanding of the vague construct of CPI. Professional identity has been a crucial construct for chiropractors since its inception. However, despite its significance, there has been no direct and comprehensive investigation into how practicing chiropractors perceive their professional identity, as revealed in the subsequent literature review.

In contrast, other healthcare disciplines have actively sought to understand and have thus developed and employed various scales to measure and comprehend the impact of professional identity within diverse health contexts (Barbour & Lammers, 2015; Matthews et al., 2019; Moola, 2017; Prosek & Hurt, 2014; Woo et al., 2018). Research has indicated that a

strong professional identity may have varied effects, influencing patient care and health outcomes in different ways (Molleman & Rink, 2015; Ramvi, 2015). It can lead to improvements (Piil et al., 2012; Zarshenas et al., 2014) or even reductions in patient care quality and health outcomes (Traynor & Buus, 2016). Measurement tools like the ones mentioned have played a vital role in various social, behavioural, and social science disciplines (Boateng et al., 2018). They enable quantitative examination of health outcomes (Clohesy et al., 2022) and underlying aspects such as professional identity (Woo & Henfield, 2015).

The absence of a professional identity assessment tool exclusively tailored for chiropractors is a significant problem (Glucina, et al., under review). Utilising such a tool may assist in understanding the paradoxes and issues raised in this chapter, as well as in operationalising research in different contexts. Furthermore, gaining deeper insights into the contribution of the professional identity construct to other health professions can yield wide-ranging benefits, including enhancing, individual practitioner satisfaction and performance (Branch et al., 2017; Depner et al., 2021), promoting collaborative care (Adler et al., 2007; Molleman & Rink, 2015; Touati et al., 2019), and improving patient care and informing student education (Wilson et al., 2013; Johnson et al., 2012).

Obtaining a better understanding of the profession's current professional identity can be particularly valuable in guiding its future development; especially when considering novel situations such as the COVID-19 pandemic, and the recent lockdowns that challenged the way chiropractors were able to conduct and express their professional identity (Glucina, 2023). To effectively steer the profession’s future trajectory, a direct and comprehensive understanding of professional identity becomes crucial, as it can address aspects related to training, roles, and positions of chiropractors in society. It is vital to create an awareness of CPI to enable a direct understanding of the role of the profession in the healthcare system.

2.7 Thesis Structure and Organisation

This thesis consists of a published comprehensive literature review on CPI (Chapter 3), a published article that defines CPI (Chapter 4), a submitted work that contains the design, the

pilot study and the results of the creation of the Chiropractic Professional Identity Embodiment Scale (CPIES) (Chapter 5), a chapter that investigates the test-retest reliability of the CPIES (Chapter 6), and an integrated discussion and conclusion (Chapter 7), followed by references and appendices.

Where applicable chapters are arranged in the style of the journals where they were authored, submitted, or published. However, instead of a summary abstract, each study is introduced by an explanatory prelude. APA referencing style is used consistently throughout the text. Below are brief summaries of each chapter.

- Chapter 3 – A published manuscript that provides an extensive critical literature review on current CPI research from the perspective of the practicing chiropractor (Glucina et al., 2020). The manuscript identified and recommended that a lack of understanding of CPI may be in part due to the lack of a definition.
- Chapter 4 – This published manuscript identifies the domains and attributes that encompass CPI utilising a concept analysis approach (Glucina et al., 2023a). From this a definition of CPI is proposed.
- Chapter 5 – This chapter is a submitted mixed-method manuscript that outlines the development and validation of the Chiropractic Professional Identity Embodiment Scale (Glucina et al., 2024).
- Chapter 6 – This chapter further investigates the psychometric robustness of CPIES by evaluating test-retest reliability.
- Chapter 7 – The chapter provides an overall integrated conclusion of the previous chapters. Key limitations of the research, future research recommendations, as well as practical recommendations for practitioners and researchers are included.

The final section of the thesis contains an all-encompassing reference list and appendices that provide pertinent supplementary materials. These include the letter of ethical approval, the advertisements utilised for recruitment purposes, the participant information sheets, the consent forms, the cognitive interview questions, and the study questionnaires. Relevant tables and figures are also included. The appendices have been compiled to aid in the examination or potential reproduction of research derived from this study. Additionally,

since publications were produced from the data obtained from this research, there is some overlap in definitions, concepts, and topics due to the comparable background information required for each publication and journal.

Chapter 3: Moving towards a Contemporary Chiropractic Professional Identity

Prelude

Since the inception of the chiropractic profession, debate has continued on differing practice objectives and philosophical approaches to patient care. While the political and academic leaders of the profession continue to dominate the discourse, little is known on the perspectives of the everyday practicing chiropractor on their professional identity.

In this chapter, professional identity within the profession of chiropractic will be evaluated using a systematised search strategy of the literature. The critical review will focus on the professional identity subgroups within the chiropractic field and the significance of these within the profession. Additionally, practice objectives will also be evaluated.

This chapter, a published article in the journal *Complementary Therapies and Clinical Practice*, aims to fulfil the initial objective of this thesis project, aiming to understand the present comprehension of chiropractic professional identity, among chiropractors actively practicing in the field.

3.1 Introduction

The changing nature of health professions and the relationship between professions in the public sector has been the focus of much interest (Hotho, 2008). Chiropractic is no exception, with a large degree of discourse being from within (Good, 2016; Villanueva-Russell, 2011). Contention exists on what characterises the chiropractic profession relating to philosophy and scope of practice, and chiropractic researchers and academics provide much commentary on the continued difficulty to define its identity (Brown, 2016; Good, 2016; Hart, 2016; Nelson et al., 2005; Rosner, 2016; Schneider et al., 2016). The importance of professional identity is paramount to the survival of any profession - as former secretary-general of the World Federation of Chiropractic, Chapman-Smith (2000) stated, "quite

simply, a product or service not understood is not used" (p.150). For this to occur, a profession must first understand itself.

Chiropractic has been described by the World Health Organisation as “a healthcare profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal (NMS) system and the effects of these disorders on general health; there is emphasis of manual techniques used such as joint adjustments and/or manipulation, with particular focus on subluxations” (World Federation of Chiropractic, 2009, p.3). An evaluation of this definition suggests that there is a range of approaches within chiropractic, yet in general, patients typically report a high level of satisfaction with the chiropractic care that they receive (Davis & Bove, 2008; Gaumer, 2006; MacPherson et al., 2015; Rowell & Polipnick, 2008; Weigel et al., 2014).

Within the chiropractic profession, there is debate around the contrasting practice objectives of a short-term biomedically focused musculoskeletal (MSK) treatment style of practice (Chapman-Smith, 2005; Nelson et al., 2005; WFC Task Force Presentation, 2005) versus a long-term vitalistic vertebral subluxation wellness focus style of practice (Hawk et al., 2005; Jolliot, 2006; Senzon, 2011; WFC Task Force Presentation, 2005). Vertebral subluxations (VS) are hypothesised to be biomechanical derangements of the spine (as a result of stresses on the body), producing clinically significant maladaptive effects on neurological function and sensorimotor integration (Haavik-Taylor et al., 2010; Henderson, 2012). For the individual, reduction of VS is theorised to improve health and quality of life (de Souza & Ebrall, 2008; Ebrall, 2009; Kent, 2018b). By analysing and correcting VS through the chiropractic intervention, the adjustment, it is posed that an individual is placed on a more optimum physiological path, with the potential to increase resilience and adaptability (Kent, 2018a). The MSK framework of chiropractic care considers that chiropractic treatment improves dysfunctional joints by mobilisation, which in turn reduces pain and improves function (Schneider et al., 2016). Some chiropractors with a MSK-focus practice objective make claims that the VS-focus chiropractors are held in older concepts - that subluxation is the cause of all disease, even though there has been evolution of VS theory (Haavik et al., 2010; Kent, 2018a; Senzon, 2018c). There is a large group within the profession, the ‘centrists’, that incorporates the traditional philosophy of VS-focused chiropractic, while also

having a practice objective of treatment of general MSK complaints (WFC Task Force Presentation, 2005).

These differing practice objectives have been at the centre of robust debate with considerable disagreement on practice scope and lexicon (Villanueva-Russell, 2011). As it currently stands, the progression of chiropractic may be hindered by this division on foundational concepts and by the clustering of those who practice into rival camps (McDonald et al., 2004). Attempts to bridge the gap between the approaches have been contentious (Briggance, 2005; Villanueva-Russell, 2011), and the profession has not yet resolved issues of professional and social identity (Leboeuf-Yde et al., 2019; Meeker & Haldeman, 2002).

Chiropractic has been successful in attaining the formal criteria of a healthcare profession (Brosnan, 2017), and over the last 50 years, the professional focus of chiropractic has included obtaining formal recognition by government agencies, achieving insurance equality, and gaining greater acceptance in healthcare (Jolliot, 2012; Peck, 2013). Nonetheless, the chiropractic profession continues to be globally underrepresented in most discussions on healthcare delivery (Rosner, 2016) and remains largely marginalised from public health systems, with chiropractors increasingly forced to defend their professional status (Brosnan, 2017). The following information will introduce the importance of professions, professional identity and how it relates to the chiropractic profession.

3.1.1 Professions and Professional Identity

The word profession comes from the Latin word *profiteor*, as the act of publicly declaring to offer a service as a means of social utility. Sociologists and psychologists have examined professional identity for many decades (Abbott, 1988; Goode, 1960; Saks, 2012). It can be accepted that the term traditionally profession relates to a group of people having the same intellectual/artistic job, who share a specific field of knowledge that requires special education, training, skills and experience (Abbott, 1988; Evetts, 2006). More recently, what defines a profession has shifted from trait and functionalist theories through to those concerned with the "essence" of a profession (Freidson, 1994).

The social process of an occupation transforming into a profession is termed professionalisation. Professionalisation is the process in which professionals create and control a market for their professional skills and knowledge to secure their social and economic position (Larson, 1977). This process can occur for many reasons, such as the advancement of science and its ramifications on the division of labour (Larson, 1977). This has been observed with the rise of the importance placed on managerial dominance to guideline industry which has been said to contribute to stratification within medicine (Harrison & Ahmad, 2000). Division of labour can be within the domain of scope of practice (SCOP), which is the regulation of professionals in a specific jurisdiction and legally creates boundaries by restricting a specified profession's permissible activities (Cassidy, 2013).

Professions are often a perceived singular unit concerned with defence of a status quo as opposed to adapting to changing needs and demands of the market (Hotho, 2008). Another view argues that change provides an opportunity for professions to renew themselves (Nancarrow & Borthwick, 2005). In order to preserve a profession, strategies are applied to maintain the status of its identity through its professional boundaries (Hotho, 2008). Where there is contextual change within a marketplace, professions deploy defensive strategies to either protect boundaries or reject or make claim to new areas of knowledge (Abbott, 1988). Control over specialised scientific or expert knowledge is deemed necessary for a profession's achievement, and abstract knowledge delineates the profession's jurisdictional control. This control of knowledge also forms the basis of practical techniques and political autonomy in distinguishing itself in a competitive marketplace (Abbott, 1988). Freidson, (1994) a leader in the professional identity field, argues that it is the responsibility of professions to establish the rationale and justifications of their professional status, and postulates that professionalism is now being re-created through hierarchical control whereby everyday practitioners are subject to the control of professional elites who exercise administrative and cultural authority. These newer professionalisation tactics have been said to create internal divisions within medicine (Harrison & Ahmad, 2000; Martin et al., 2009) and homeopathy (Degele, 2005).

Professional identity is the ownership of a core set of values, beliefs and assumptions about a profession's unique characteristics, that differentiates it from others (Weinrach et al., 2001). Professional identity has commonly been explained in terms of Social Identity Theory.

Social identity refers to an individual's self-concept derived from membership to social groups and the values and emotional significance that they attach to belonging to those groups (Tajfel, 1974). Professional identity is one aspect of a person's social identity, and professional socialisation provides a sense of belonging, stability and esteem, which is constructed and developed over time through interaction (Hotho, 2008).

Professional identity relating to an individual's chosen field develops during one's whole life, providing a sense of continuity with the past, meaning in the present, and future direction (Beijaard et al., 2004). A unified profession is said to be essential for both the personal and social wellbeing of the individuals who comprise it as well as the greater community (de Luca et al., 2018). In this way, in order for a profession to thrive, it is paramount to seek to understand and research its identity.

3.1.2 Chiropractic Professional Identity

Amongst every profession there is a tendency to stratify into new groups in order to differentiate between areas of specialty. However, these intra-professional factions can provide specific challenges (Abbott, 1988; Hotho, 2008; McGregor et al., 2014), which is also evident within the chiropractic profession. Since its development, tensions have existed on chiropractic professional identity (CPI) and its SCOP. Historically, this has centred around differences in practice, intervention approaches and epistemological backgrounds, which is being played out today as the VS versus the MSK chiropractic approaches (Carey et al., 2005; Senzon, 2018b). Attempts have been made to reconcile intra-professional division: In 2004, the World Federation of Chiropractic (WFC), through a global consultative process, sought to deliver an international identity of chiropractic that encompassed the majority of views held amongst practitioners and organisations (Carey et al., 2005). From this, the identity statement to be "the experts in spinal healthcare within the healthcare system" (WFC Task Force Presentation, 2005, p.1.) was created. Since then, this statement itself continues to be hotly debated and is contentious amongst leaders and practitioners alike. Much commentary continues to revolve around terminology as well as philosophical and therapeutic orientations towards patient care (Carey et al., 2005; Meeker & Haldeman,

2002). Some argue that a professional unity for chiropractic does not seem possible (Good, 2016; Institute for Alternate Futures, 2013; Leboeuf-Yde et al., 2019).

While intra-professional debate surrounding CPI continues, it remains unclear what actual research exists that has examined this emotionally loaded and hotly debated subject. The aim of this paper is to critically evaluate the literature on CPI from the perspective of the practicing chiropractor. The importance of this groups' viewpoint lies in that everyday chiropractors are the ground force providers for the patient's care seeking their form of healthcare, and hence would be most affected by organisational directives on CPI.

3.2 Method

A systematised approach was employed for this critical literature review. A literature search was conducted using the Index to Chiropractic Literature, Medline, CINAHL Plus with Full Text and SPORTDiscus with Full Text through the EBSCO Health Database. Search criteria included that articles needed to be in the English language, in peer-reviewed academic journals and published between January 2000 and May 2019. These dates were selected to represent the most current research available. Searches were conducted using the following terms included in the abstract: chiropract* AND ("professional identity" OR identity) OR chiropract* AND character* OR chiropract* AND perception* OR chiropract* AND perspect* chiropract* AND "scope of practice".

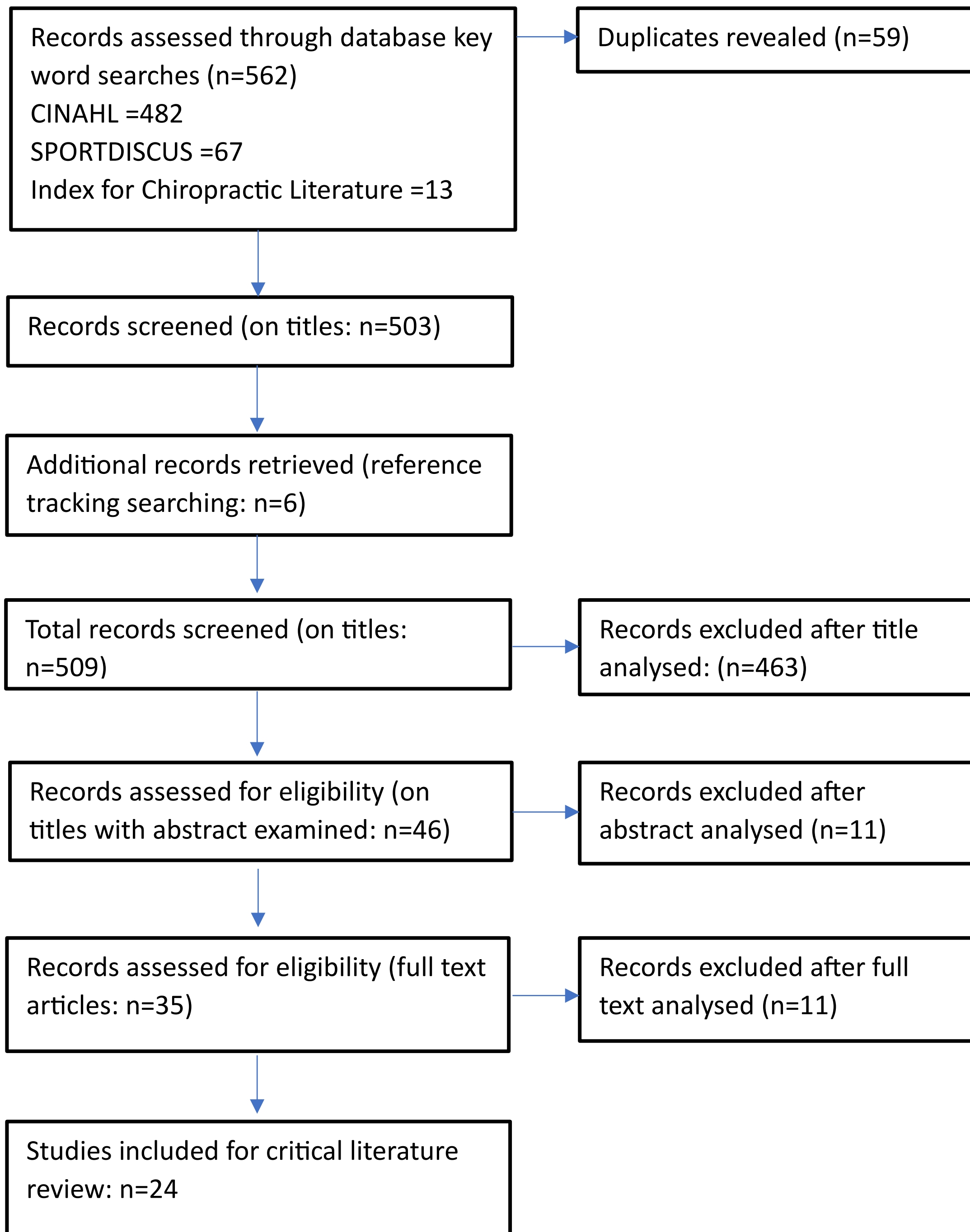
Studies that investigated (either qualitatively, or quantitatively) analysis of SCOP (e.g., VS or MSK practice objectives) and/or views and attitudes of practicing chiropractors on identity were included for review. Professional identity evaluation was not necessitated to be the primary objective of the entire research. If aspects of professional identity were examined, the paper was included in this critical review. Commentaries, letters, dissertations, theses, conference proceedings and poster presentations were excluded.

From the search terms above, a total of 562 articles were identified through database searches. After 59 duplicates were removed 503 articles remained. Additional hand searches and reference tracking searches revealed 6 articles, leaving 509 articles for screening of abstracts and articles. Full-text articles were retrieved for 35 articles that were read to

ascertain whether they met the inclusion/exclusion criteria of this review. After this eligibility assessment, 24 articles were retained for evaluation (Figure 3.1).

Figure 3.1

Search Strategy for Critical Literature Review



3.3 Results

3.3.1 Data abstraction and synthesis

Analysis was conducted to identify the main characteristics and differences between studies systematically. Extracted data included author(s), study focus and location, year of data collection, sample characteristics, methods/methodology, and summary of results relating to CPI and SCOP. Since many of the articles were quantitative analyses of survey instruments, psychometric properties such as validity/reliability were also obtained. The main characteristics of the 24-studies are presented in Table 3.1.

Studies in this review are from diverse international locations, with the majority of research being conducted in Europe (Ailliet et al., 2010; Gíslason et al., 2019; Hennius, 2013; Humphreys et al., 2010; Jones-Harris, 2010; Malmqvist & Leboeuf-Yde, 2008; Nielsen et al., 2015; Pollentier & Langworthy, 2007), and the United States of America (USA) (Chang, 2014; Duenas et al., 2003; Lisi et al., 2010; Redwood et al., 2008; Smith & Carber, 2008, 2009; Villanueva-Russell, 2011). Research was also conducted in Canada (McGregor et al., 2014; Puhl et al., 2014), Australia (Adams et al., 2017, 2019), and South Africa (Johl et al., 2017; Myburgh & Mouton, 2007). Multiple geographic locations were used for three projects; Canada, United States, Mexico, Hong Kong, Japan, Australia, and South Africa (Leboeuf-Yde et al., 2005), the United States, Canada and Mexico (McDonald et al., 2004), and the United Kingdom and Australia (Brosnan, 2017). Sample size varied in this review from a single-case study (Hennius, 2013) through to responses from 3,559 participants (Smith & Carber, 2008). The mean sample size was 406 per study, with a bimodal distribution that peaked around 50-99 (Ailliet et al., 2010; Chang, 2014; Nielsen et al., 2015; Villanueva-Russell, 2011) and 500-999 (McDonald et al., 2004; Puhl et al., 2014; Smith & Carber, 2009).

The majority of articles were quantitative analyses of survey instruments (Adams et al., 2017, 2019; Ailliet et al., 2010; Blaich et al., 2018; Chang, 2014; Gíslason et al., 2019; Humphreys et al., 2010; Johl et al., 2017; Leboeuf-Yde et al., 2005; Lisi et al., 2010; Malmqvist & Leboeuf-Yde, 2008; McDonald et al., 2004; McGregor et al., 2014; Nielsen et al., 2015; Pollentier & Langworthy, 2007; Puhl et al., 2014; Redwood et al., 2008; Smith

Table 3.1

Summary of Research Findings for Chiropractic Professional Identity

Reference & Study Focus (αβγ)	Year of data collection. Data location and sample	Method/ Methodology	Additional notes	Summary of results relating to CPI and/or SCOP
Quantitative				
(Gíslason et al., 2019) **α**	• 2017 • Europe • EAC and ECU members *n*=1322 RR=17.2%	• Adapted survey from McGregor et al. (2014) with 5 CPI subtypes to be evaluated • Sent via email	• Face validity tested on AECC faculty • Greater generalisability as all European associations represented regardless of ECU membership	Five categorisations of chiropractic identity were evaluated: From the categorisations, chiropractors indicated their response as follows: • General Problems 14% - treat MSK and NMS problems and include specific disorders such as but not limited to low back and neck related pain • Biomechanical 54% - treat the broadest spectrum of health concerns and may include lifestyle and wellness issues • Biomechanical/ Organic-Visceral 4.9% - treat VS as a somatic joint dysfunction and/or related to functional or MSK or problems • Subluxation as a somatic dysfunction 7% - treat a combination of biomechanical and organic-visceral complaints • Subluxation as an obstruction to human health 20.1% - treat VS as an encumbrance to the expression of health – VS seen as an entity in and of itself, which is corrected to benefit patient well-being These five groups were then summated: • Groups 1-4 were stated as orthodox chiropractors (79.9%) • Group 5 stated to be unorthodox chiropractors (20.1%)
(Adams et al., 2019) **β**	• 2015 • Australia • ACORN project	• Cross-sectional research design • Descriptive questionnaire on	• Pilot tested: Content and face validity	• Rural and remote chiropractors report more chiropractic intervention for predominately MSK and also non-MSK and degenerative disorders • Practice analysis of rural/remote and urban chiropractors found a wide range of MSK presentations in clinical practice

	n=1907 RR=40.7%	practice characteristics and SCOP • Sent online and via hard copy		• Rural and remote chiropractors report more non-MSK and degenerative conditions or migraine for adults and children • Rural chiropractors are less likely to discuss health promotion strategies but would often discuss health and safety and other management interventions
(Adams et al., 2017) **β**	• 2015 • Australia • ACORN project *n*=2005 RR=43%	• Cross-sectional research design • Descriptive questionnaire on practice characteristics and SCOP • Sent online and hard copy	• Pilot tested: Content and face validity	From the survey data it was found that: • There is a wide range of public health and disease strategies discussed in clinical practice e.g. 84.9% chiropractors often discuss physical activities with their patients • >87% MSK and spine complaints present in practice • Multiple patient subgroups identified e.g. children 0-3 years old 30.1%, older people 73.5%, pregnant women 36.7% etc. • Non-MSK presentations seen 30% of the time in practice • Broad SCOP with a wide use of adjunct therapies often used e.g. soft tissue work 66%, taping rehab/49.3% etc.
(Johl et al., 2017) **β**	• 2015 • South Africa • Registered with Allied Health Professions Council *n*=282 RR=32%	• Descriptive study of Job Analysis Surveys • Adapted version of Humphreys et al. (2010) questionnaire • Sent online	• Pre-tested on a small group of chiropractors	• Predominance of MSK and spine presentations • Non-MSK presentations 42.7% and wellness care 84.2% reported in 1-50% of patients • SCOP included adjunct MSK therapies (e.g. trigger point therapy used in over 76% of patients) as well as health promotion strategies such as advice on ADL given 36.4% in over 76% patients
(Nielsen et al., 2015) **β**	• 2010-2014 • Denmark • DCA *n*=70 RR=32%	• Cross-sectional research design • Descriptive Survey on practice characteristics and SCOP		• Virtually all chiropractors use manipulation • Trigger point treatment and other soft tissue techniques are offered by 85-93% of chiropractors and exercise instructions are offered by more than 80% of chiropractors

		• Online questionnaire		
(McGregor et al., 2014) **α**	• 2010 • Canada • Online English-speaking chiropractic licencing body directories *n*=503 RR= 68%	• Stratified random sampling method • Questionnaire with 6 CPI subtypes to be evaluated • Postal delivery	• Pre-tested to screen for question ambiguity	Six categorisations of chiropractic identity were evaluated. From the categorisations, chiropractors indicated to be: • General (broad) 17.1% - broad perspective on the conditions they treat that includes lifestyle and wellness issues • Biomechanical 43.1% - treat mainly MSK or NMS problems including specifically low back and neck-related pain • Biomechanical/General 9.2% - combined broad perspective on the conditions they treat that includes lifestyle and wellness issues, treating mainly MSK or NMS problems including specifically low back and neck-related pain • Biomechanical/Organic-Visceral 4.2% - combined treating mainly MSK or NMS problems including specifically low back and neck-related pain some conservative component of Organic-Visceral complaints • Chiropractic subluxation as a somatic dysfunction 7.7% - consistent with a biomechanical perspective • Chiropractic subluxation as an obstruction to human health 18.8% - subluxation is an encumbrance to the expression of human health that needed to be corrected to benefit patient well-being These six groups were then summated: • Groups 1-5 being stated as orthodox chiropractors (81.2%) • Group 6 stated to be unorthodox chiropractors (18.8%)
(Puhl et al., 2014) **α**	• 2010 • Canada • English-language online directories of chiropractic	• Stratified random sample • Used McGregor (2014) questionnaire/	• Face validity tested	• Relationships exists between treatment efficacy and faction membership e.g., greater relationship of unorthodox group believing that chiropractic can treat genetic/visceral related underpinning disorders

	licencing bodies *n*=503 RR= 68%	dataset of CPI subtypes • Postal delivery		• Chiropractic education programs are the greatest predictor of faction membership for Canadian chiropractor's. Chiropractic education contributes to multiple CPI's
(Chang, 2014) **β**	• 2011-2013 • US • FCLB email list *n*= 51 jurisdictions	• Cross sectional research design • Survey with 97 SCOP services evaluated • Sent via e-mail	• Content validity tested via draft survey sent to FCLB for feedback • Duplicate question added to test reliability	• Chiropractic practice in US varies widely between jurisdiction. SCOP is dynamic and grey • Seven states have the broadest practice laws with one being the most restrictive • 90% stated limited prescription rights and minor surgery are not within the SCOP • Overall trend of increasing SCOP
(Lisi et al., 2010) **β**	• 2009 • US • VHA system *n*=33 providers RR=91.6%	• Descriptive survey on practice characteristics modified from two previous chiropractic practice surveys • Sent online		• Greatest complaint for patient presentation is MSK based • 88% of visits related to low back pain • 79% of visits related to cervical pain • Non-MSK or wellness visits over last week = 7.5% • Broad scope of interventions are used
(Ailliet et al., 2010) **β**	• 2008 • Belgium • BCU database *n*=80 RR=79%	• Descriptive survey of chiropractors on practice characteristics and SCOP of consecutive 10-patient visits		The following falls within SCOP: • 99% NMS complaints • 88% treatment of infants and children • 86.5% request diagnostic imaging • 85% Primarily focus on neck and back complaints with emphasis on spine however almost 63% feel their SCOP is not limited to MSK disorders • 81% Adjunct treatment such as ergonomic advice and exercise therapy used
(Humphreys et al., 2010) **β**	• 2009 • Switzerland	• Descriptive Job Analysis Surveys	• Face and content validity tested	• Primarily spine focussed MSK SCOP

	• SAC *n*=183 RR=70%	• Adapted from the US National Board of Chiropractic Examiners and the UK General Chiropractic Council Job Analysis surveys • Sent online		• for >51% of their patients, chiropractors give advice on ADL 43%, 25% therapeutic exercises • 73.7% provide wellness/preventative care for their patients between 1-40% of the time in practice • Children commonly seen
(Smith & Carber, 2009) **γ**	• 2002-2003 • US • State board licensed *n*=720 RR=52%	• Cross-sectional research design • Pragmatic, descriptive, attitudinal survey on practice characteristics and SCOP and health care categorisation • Postal delivery with follow up phone calls		• Chiropractors described themselves as both back pain and MSK specialist as well as primary care generalist. • 90% considered themselves capable of diagnosing broad range of health disorders not limited to back pain or MSK and 79% capable of treating such conditions • 80% consider themselves back pain or MSK specialist • 73% see themselves as primary care specialist
(Smith & Carber, 2008) **α**	• 2002-2003 • US • State Board licensed sample *n*≈3000 RR≈50%	• Cross-sectional research design • Non-replacement sampling frame • Pragmatic, descriptive survey on philosophical notions of CPI and	• Pre-validation and pilot testing on leaders of COCSA NCBE FCLB	Chiropractors consider: • >70% detection and resolution of subluxation guides clinical care or decision making • >75% clinical approach to addressing NMS disorders were subluxation based • >70% clinical utility of subluxation concept is important • Subluxation approach limited utility for visceral disorders

		practice characteristics • Postal delivery with follow up phone calls		
(Redwood et al., 2008) **γ**	• YNS • US • Representative PBRN *n*=132 (71-faculty RR=37% 61-chiropractors RR=57%)	• Descriptive survey on chiropractic related to wider healthcare categorisations • Klimenko instrument used on concepts of health from CAM providers • Sent online	• Original survey was pilot tested for content validity • 3 questions - No assurance control on content validity of these	• Chiropractors are considered to be the largest CAM profession, yet 69% chiropractors reject this grouping • 27% show some preference for Integrated Medicine • Of the data that exclusively analysed practicing chiropractors, it was found that 41% classify chiropractic to be CAM, Integrative Medicine, 38% Mainstream Medicine 20%
(Malmqvist & Leboeuf-Yde, 2008) **β**	• 2005 • Finland • FCU *n*=44 RR=88%	• Cross-sectional research design • Descriptive survey on practice characteristics and SCOP	• Pilot tested for face validity	• Vast majority consider their SCOP approach to MSK with chiropractic techniques and soft tissue work • Adjunct therapies used by some e.g. ice 46%
(Pollentier & Langworthy, 2007) **α β γ**	• YNS • UK • GCC Association database • Sample 1: N=490 *n*=249 RR=54%	• Random sample (tested to be representative) • Descriptive questionnaire on philosophical notions of chiropractic, SCOP	• Weak to moderate internal consistency (r=-.265) of the two samples (sample 2 was testing whether it was representative of sample 1)	• 100% agreement that chiropractic good for spinal mechanical dysfunction ad MSK conditions • 98% believe chiropractors are primary contact practitioners • 78% primarily NMS and to some degree visceral organic • 76% traditional beliefs (chiropractic philosophy) important • 73% mainstream and chiropractic paradigms compatible • 69% not only NMS specialist • 63% subluxation central to intervention

	• Sample 2: A further N=45 RR 53%	and practice characteristics, and wider health care categorisation • Postal delivery		• Strongly believe chiropractic intervention beneficial for adults for mechanical dysfunction and some visceral • Firm believe chiropractic is effective in MSK of adolescent and some infantile systemic conditions • Non-MSK complaints benefit from chiropractic care e.g. Premenstrual Syndrome 70%, Asthma 64%, Gastrointestinal complaints 61%
(Leboeuf-Yde et al., 2005) **α β**	• 2002-2003 • Canada, US, Mexico, Hong-Kong, Japan, Australia, and South Africa • Data collection on research site with local chiropractors *n*=385	• Convenience sample of local chiropractors • Descriptive questionnaire on philosophical notions of CPI and practice characteristics		• 75% chiropractors believed that it was always or often more important to correct VS than to relieve symptomatic complaints • 74% chiropractors (in the past 3 months) told all or most of their patients that chiropractic adjustments might have NMSK effects on their bodies • Chiropractic management was for low back pain (60%) and neck problems (51%) • The 3 most common NMSK complaints reported for patients by the chiropractor were problems with digestion (19%), problems with circulation (12%), and allergy (11%) • Manual adjustments given in 83% of patients, 52% received soft tissue therapy • 35% were treated with mechanically assisted adjustments
(McDonald et al., 2004) **α β**	• YNS • US 91.8% Canada 8% Mexico .3% • Dynamic Chiropractic magazine database *n*=655 RR=68.3%	• Systematic random attitudinal descriptive survey on philosophical notions of CPI, practice characteristics and SCOP • Postal delivery	• Pre-tested on a non-random sample • Questions critiqued/face validity tested	• 89.8% adjustment should not be limited to MSK conditions • 88.1% wished to retain term VS • >75% chiropractors favour a broad scope of services • Across several items > 75% finds adjustment of VS elicits improvements in visceral conditions. • Broad (MSK), middle (centrist) and focused (VS) scope chiros agree on all issues except divide evenly on views surrounding limited prescription rights

(Duenas et al., 2003) **βγ**	• 1999 • Survey 1: *n*=13 (RR= 59%) of N=22 accredited chiropractic college presidents and *n*=14 (RR= 38%) of N=37 international chiropractic organisation leaders from ACA or ICA membership directories • Survey 2 average *n*= 159 Connecticut-licensed chiropractors providing NMS care (RR= 25%)	• Part 1: Literature review to apply the terms *primary care*, *NMS care*, or *MSK care* to the practice of chiropractic, particularly in Connecticut • Part 2 (Survey 1 & 2): Descriptive survey on chiropractic related to wider healthcare categorisations		• Definitions of Primary Care and Primary Care Provider are found to be attributable to chiropractic: No definitions found on NMS and MSK care • Intra-professional consensus that chiropractors are Primary Care Providers • 83% chiropractors are not exclusively NMS providers: multiple services rendered in chiropractic practice e.g. family practice, sports medicine, stress management, subluxation correction
Mixed Methods				
(Jones-Harris, 2010) **βγ**	• YNS • UK • Qualitative *n*=7 • Quantitative *n*= 416 RR=69%	• Mixed Methods Sequential Exploratory Design • Face to face faculty interviews from	• Pilot testing of survey for face validity • Exclusion of McTimoney College of Chiropractic (an institution not accredited	• Chiropractors strongly agree that they are Primary Contact Healthcare Practitioners (can diagnose and refer) • Chiropractors strongly consider that they are not Primary Healthcare Practitioners as they are unable to treat all medical conditions that present in primary healthcare setting

		AECC and Welsh Institute of Chiropractic • Thematic Analysis to inform descriptive questionnaire on chiropractic related to wider healthcare categorisations • Postal delivery	with the ECCE at the time of the study) acknowledged to limit generalisability	
Qualitative				
(Brosnan, 2017) **α**	• 2014-2016 • UK and Australia *n*= 23 (16-chiropractic academics and 7 political elite practitioners e.g. on advisory boards, associations)	• Purposive sampling using reflexive sociologist Bourdieusian framework to assess for chiropractic professionalisation strategies • Face to face interviews • Constant Comparative Method for themes	• No comment as to whether saturation was achieved • No comment on triangulation	• Divergent approaches exist within the profession relating to paradigms, identity and education • Tension exists between MSK focus and chiropractors with traditional approaches. Central to the competition in the profession is how to define chiropractic. Both camps unified only in the agreement that the profession is in crisis • Divergent strategies exist across two opposing poles: ○ The academics (and some practicing chiropractors) prioritise evidence based, MSK approaches to be in alignment with medical and allied health sector strategy • VS based practitioners promote creation of new education channels with vitalistic philosophy and professional distinction and autonomy

(Hennius, 2013) **α β**	• 2008 • UK • Self-selected *n*=1	• Interpretative functionalist realist field study	• Single case only • No blinding or triangulation	• Chiropractor self-identified as primarily being an MSK specialist where additional health benefits received by the patient from chiropractic care were considered a bonus • Belief that chiropractic improves wellbeing
(Villanueva-Russell, 2011) **α**	• 2002-2010 • US articles *n*=98 papers evaluated (78% peer-reviewed mix of commentary, surveys and magazines)	• CDA through the lens of professional crisis to examine the movement of at the following levels: 1. Thematic text analysis 2. Discourse practice 3. Social practice	• Limitation: No accepted methodological procedures for CDA • Reflexivity noted, no comment on triangulation	• Discrepancies between everyday practicing chiropractors and a small group of academics, researchers and chiropractic leaders over the importance of science for the profession • Academics/leaders utilise rhetoric, status, institutional position, and their roles as journal gatekeepers to dominate the discourse and propel the back/neck pain specialist approach. The tactic is to silence the traditional VS approach with emotionally loaded discourse e.g. accusations as using pseudoscience or fundamentalist labels • Challenge in how to reconcile differing philosophy of vitalistic chiropractors who argue for expanding SCOP to include emotional and psychological wellbeing. This is compared to positivistic science based MSK chiropractors that advocate narrowing the SCOP to neck and back pain management • Need for everyday chiropractor to participate in CPI discourse which is currently being decided by academics and neck/back pain segment
(Myburgh & Mouton, 2007) **α**	• YNS • South Africa • Durban chiropractors *n*=10	• Purposive Maximum Variation Sampling • Face to face semi-structured interviews • Phenomenological case studies - Inductive Analysis for philosophical	• Data collection was completed until saturation was achieved • Triangulation noted with second author • With Maximum Variation Sampling "typical" chiropractor may not be represented • Durban location may create limited generalisability	• Lack of coherent identity, marketable model of practice and poor interprofessional relationships impact the progression of the profession • Broad practice models from multimodal to mechanistic approaches exist • 2 main classification of chiropractor practice objective exist: ○ The Technician (limited diagnostic function - the vitalist philosophy) ○ The Physician (primary care practitioner: biomedical philosophy) ○ Mixed views also present.

	notions of chiropractic	

Table 1 Abbreviations:
α= Study focus on philosophical notions and concepts of chiropractic professional identity
β= Study focus on practice characteristics and scope of practice
γ= Study focus on grouping chiropractic practice into healthcare categorisations

ACORN= Australian Chiropractic Research Network, BCU= Belgian Chiropractic Union, CAM= Complementary Medicine, CDA= Critical Discourse Analysis, COCSA= Congress of Chiropractic State Associations, CPI= Chiropractic Professional Identity, DCA= Danish Chiropractic Association, EAC= European Academy of Chiropractic, ECU= European Chiropractors' Union, FCLB= Federation of Chiropractic Licensing Boards, FCU= Finnish Chiropractic Union, GCC= General Chiropractic Council, NCBE= National Board of Chiropractic Examiners, N= target sample, *n*= sample size, NMS= Neuro-musculoskeletal, non-MSK= Non-musculoskeletal, MSK= Musculoskeletal, MVS= Maximum Variation Sampling, PBRN= Practice Based Research Network, SAC= Swiss Association of Chiropractors, SCOP= Scope of Practice, UK=United Kingdom, US= United States of America, RR=response rate VHA= Veterans Health Administration, VS= Vertebral Subluxation, YNS = year not stated

& Carber, 2009, 2008), with the exception of one mixed-methods study (Jones-Harris, 2010) that used qualitative inquiry to inform an instrument that was analysed quantitatively. One study used a questionnaire aimed at quantifying the professional stratification (of six pre-defined subgroups) among Canadian chiropractors (McGregor et al., 2014), which formed the basis for other studies both with (Gíslason et al., 2019) or without (Puhl et al., 2014) additional adapted questions. Another questionnaire was created using the National Board of Chiropractic Examiners (USA) Job Analysis Survey as a template, as well as adapting questions from the United Kingdom survey from the General Chiropractic Council, to examine Swiss chiropractic practice characteristics (Humphreys et al., 2010). This questionnaire was also used by Johl et al. (2017), with adapted additional questions.
Four qualitative studies (Brosnan, 2017; Hennius, 2013; Myburgh & Mouton, 2007; Villanueva-Russell, 2011) were included in this review. Of these, one examined methods of professionalisation used by the two CPI poles e.g., the vitalistic VS focused and biomedical MSK focused practice objectives (Brosnan, 2017), with another evaluating the literature using Critical Discourse Analysis (Villanueva-Russell, 2011).

Further examination of the eligible articles found three overarching concepts. Studies were divided into three types of research approaches, with some overlap (Table 3.2). These include: 11 articles with a research focus on philosophical notions and concepts of professional identity, 15 articles with a research focus on practice characteristics and SCOP, and 5 articles with a research focus on grouping chiropractic into wider healthcare categorisations.

For research relating to CPI philosophical notions, this review confirmed the three main practice objectives previously stated in the literature. These include the MSK, centrist and VS focused approaches. Notably, these main groupings are at times labelled differently. For example, in the qualitative study by (Myburgh & Mouton, 2007), the vitalist chiropractor is referred to as a technician, and the biomedical chiropractor is referred to as a physician. Some of the studies contrast the two historically polarised MSK and VS approaches by categorising practice objectives into these dichotomous groups (Gíslason et al., 2019; McGregor et al., 2014; Myburgh & Mouton, 2007; Puhl et al., 2014), hence the proportion of those who may hold a centrist practice objective is not researched or explicitly quantified.

Table 3.2

Summary of Study Focus for Articles in Critical Literature Review

Philosophical notions and concepts of chiropractic professional identity	Practice characteristics and scope of practice	Grouping chiropractic practice into healthcare categorisations
Gíslason et al. (2019) McGregor et al. (2014) Puhl et al. (2014) Smith & Carber (2008) Pollentier & Langworthy (2007) McDonald et al. (2004) Brosnan (2017) Hennius (2013) Villanueva-Russell (2011) Leboeuf-Yde et al. (2005) Myburgh & Mouton (2007)	Adams et al. (2019) Adams, Lauche, et al. (2017) Johl et al. (2017) Nielsen et al. (2015) Chang (2014) Hennius (2013) Jones-Harris (2010) Lisi et al. (2010) Ailliet et al. (2010) Humphreys et al. (2010) Malmqvist & Leboeuf-Yde (2008) Pollentier & Langworthy (2007) Leboeuf-Yde et al. (2005) McDonald et al. (2004) Duenas et al. (2003)	Smith & Carber (2009) Redwood et al. (2008) Jones-Harris (2010) Duenas et al. (2003) Pollentier & Langworthy (2007)

Whilst SCOP is under jurisdictional control by individual state or country, papers in this review that investigated SCOP reported on chiropractors utilising traditional chiropractic interventions alongside soft tissue approaches (Adams et al., 2017, 2019; Ailliet et al., 2010; Chang, 2014; Hennius, 2013; Humphreys et al., 2010; Johl et al., 2017; Leboeuf-Yde et al., 2005; Lisi et al., 2010; Malmqvist & Leboeuf-Yde, 2008; McDonald et al., 2004; Nielsen et al., 2015). All studies that investigated SCOP relating to patient subgroups (e.g., acute, chronic, paediatric, athlete, older adult etc. patient groups) found that chiropractors care for multiple patient subgroups across multiple ages (Adams et al., 2017, 2019; Ailliet et al., 2010; Humphreys et al., 2010; Johl et al., 2017; Pollentier & Langworthy, 2007)

Results varied for healthcare categorisation within wider healthcare. Some chiropractors consider themselves as Integrative Medicine or CAM providers (Redwood et al., 2008). Chiropractors have also demonstrated their preference as being Primary Contact Practitioners (Jones-Harris, 2010; Pollentier & Langworthy, 2007), Primary Care Providers

(Duenas et al., 2003), MSK specialists (Hennius, 2013; Humphreys et al., 2010; Smith & Carber, 2009) and back pain specialists or primary care generalists (Smith & Carber, 2009).

3.4. Discussion

The purpose of this review was to evaluate the body of knowledge on practicing chiropractors' perspectives on their professional identity. This study confirmed that the literature mostly uses the following terms to classify the different approaches of chiropractic professional identity (CPI): the vitalistic VS-focused (or subluxation-based), centrist, and biomedical MSK-focused approaches. Three key and overlapping areas of study focus are found to assess professional identity as it relates to philosophical concepts, practice characteristics and SCOP, and grouping of chiropractic into wider healthcare categorisations. The following discussion summarises the main findings of the review.

3.4.1 Competing Identities

Polarised, and at times competing, intra-professional identities are not unique to the chiropractic profession and is apparent amongst many professions including counselling services (McLaughlin & Boettcher, 2009; Remley & Herlihy, 2014), physiotherapy (Fornasier, 2017), homeopathy (Brindle & Goodrick, 2001) and osteopathy (Cummings, 2006). Within the literature on the practice of family medicine, for example, at least three models have been discussed ranging from: a holistic biopsychosocial orientation that cares for the under-served; a pragmatic approach that considers market forces and personal practice styles; and family medical practitioners acting as gatekeepers for specialty care referral (Carney et al., 2013). Within family medical practice, two distinct divergent approaches have been identified with potential future implications on the profession: The 'generalist' works to preserve traditional functions while adapting to changing contexts with a large SCOP compared with the 'specialist' that concentrates on increasing specialisation amongst general practitioners (Beaulieu et al., 2008). This differentiation is said to be the result of a rapidly expanding scope of practice, as well as the high value attributed to specialisation from society and the professional system (Beaulieu et al., 2008).

The existence of multiple identities within healthcare may not be as important as how one feels about the group that they belong in – a positive, strong, self-selected and flexible professional identity has been shown to influence an individual's satisfaction and professional success (Skorikov & Vondracek, 2011). Within the nursing profession, it has been observed that a strong coherent professional identity creates a more productive and committed professional who is beneficial to other healthcare workers as well as patients (Cowin et al., 2013). How nurses think and feel about themselves also supports patient care within a positive environment and enhances job satisfaction and retention rates (Horton et al., 2007). It has been posed that a unified profession is essential for both the personal and social wellbeing of the individuals who comprise it as well as the greater community (de Luca et al., 2018). Perhaps it is not the unified aspect that is the function of personal wellbeing and professional confidence – instead it may be the result of intra-professional respect that professional identity is individual and may evolve and change that promotes strong social and professional wellbeing? In this way, it may be useful for the chiropractic profession to continue to investigate ways to establish a more contemporary CPI.

From the papers in the review with a focus on CPI in terms of philosophical notions and concepts, research was directed on the different chiropractic identity subtypes and practice objectives. McDonald et al. (2004) expressed the three main identities along a graded continuum from one (broad/mixer) to ten (focussed/straight), with five representing the middle scope. Research that categorised pre-prescribed chiropractic identities into discreet subtypes, further grouped the findings (Gíslason et al., 2019; McGregor et al., 2014; Puhl et al., 2014) into two polarised approaches; these are referred to as *orthodox* (MSK biomedical) and *unorthodox* (vitalistic VS) approaches (Gíslason et al., 2019). McGregor et al. (2014) found that 18.8% of chiropractors use a VS approach in clinical practice. In this research, McGregor et al. (2014) asked participants to self-select their practice objective into one of six groupings. These subgroups were then summated with the VS subgroup termed as *unorthodox* and the remaining five categories as *orthodox*. However, when you also consider that one of the so-called *orthodox* categories also utilised the term VS, the percentage of chiropractors who self-categorise as having a VS focus increases to 26.5%. The authors of this study chose not to group these two categories together as *unorthodox*. Gíslason et al. (2019) adapted the original categorisations of practice objectives of McGregor et al. (2014)

from six to five categories. This research found 20.1% of chiropractors to practice within the *unorthodox* paradigm, however, when adding the two categories that include VS as a practice objective option for the chiropractor to self-select, the percentage increases to 27.1% (Gíslason et al., 2019). In both studies, it should not be understated that, when adding both categories of practice objectives that have a VS focus, the percentages reflect a significant proportion of the profession. This is in contrast to Smith and Carber (2008), whose research evaluated the degree of importance and prevalence of a VS focus in clinical practice, which found that over 70% of study participants used VS to guide their practice.

Within the chiropractic profession, there has already been some critique on the original categorisations used by McGregor et al. (2014). Senzon (2018a) argued that these categorisations do not capture the historical complexity of the VS approach with respect to discrete practice styles. He further stated that many of the groupings overlap and hence may not accurately capture a true impression of the diversity in chiropractic practice. Notably, further reading on the primary research for the original construction of these categorisations shows some potential flaws to generalisability. The six strata groupings (McGregor-Triano, 2006) were derived from survey information relating to the identification, means of evaluation and treatment of health problems that chiropractors address, gathered from 64-individuals, 25% of which were practicing chiropractors. Of the three individuals that were asked to post-evaluate these subgroups (for validity), none were stated to be practicing chiropractors, instead they were involved in research, policy or publication - potentially introducing bias. These potential limitations could affect generalisability of some studies in this review of CPI, which used this classification system as a basis for their research (Gíslason et al., 2019; McGregor et al., 2014; Puhl et al., 2014).

3.4.2 Scope of Practice

The chiropractic SCOP is important to several stakeholders including patients, healthcare providers, organisations and policy makers (Chang, 2014). In order to reduce confusion, some have advocated for a uniform chiropractic practice act in the USA (Duenas et al., 2003). However, this may be challenging given the USA does not have a unified SCOP for most healthcare professions (Chang, 2014). Studies that demonstrate the effect of utilising

chiropractic legislative SCOP on actual clinical practice have not yet been conducted. What research has been conducted, suggests that individual chiropractors and/or patient preferences set their own limit on their SCOP (Gaumer et al., 2002).

Chiropractic SCOP is relevant to CPI to differentiate it from other manual therapies which use similar modalities with an MSK focus; it has been suggested that VS is central to chiropractic, which sets it apart from other professions (Russell, 2019), however the general public may not be aware of the VS-focus which may be the result of to the lack of a coherent CPI. A New Zealand study explored how various MSK providers discussed their treatment approaches compared to other primary care practitioners (Norris, 2001). It was uncovered that many professions (e.g., chiropractors, osteopaths, physiotherapists and general practitioners) are seen to employ similar modalities or methods to treat a condition. In this way, the division of labour or SCOP overlaps (Abbott, 1988). This implies that in some cases the *what* or *how* a practitioner practices may be less important than the *why* in terms of professional identity (Norris, 2001). This could mean that there may be merit in preserving and promoting traditional aspects of chiropractic philosophy both within the chiropractic profession, and to the wider healthcare profession and general public.

According to Freidson (1994), professions are distinct from other occupations in their ability to control their own work and have professional autonomy. No matter how specialised, professionals can seldom free themselves from stereotypical assumptions of people outside the profession irrespective of the profession's resources (Freidson, 1994). If the public has a stereotype of chiropractic being related to the spine, then a unified identity of a spine focus for the public's understanding as the management emphasis of the chiropractic profession may be the most marketable approach (Briggance, 2005; Roeckelein, 2006; Schneider et al., 2016). However, two recent studies suggest that perceptions (and thus potentially stereotypes) on the purpose of chiropractic care can be changed when communicating and educating individuals on VS based care – this was found to occur with both the general public (Russell, 2016) and for new patients who received VS focused chiropractic care (Russell, 2017).

3.4.3 Professional Unification or Dissolution

Larson (1977) stated that internal unification of a profession involves a process of conflict and struggle about who shall be included or excluded. Thus, a crucial comparative research question becomes how and in what ways the discourse of professionalism is being used (by employers and managers, and by some relatively powerful occupational groups themselves) as an instrument of occupational change (including resistance to change) and social control (Evetts, 2006). Some papers in this review identified this organisational control (Brosnan, 2017; Villanueva-Russell, 2011). Brosnan (2017) discusses the strategies of the academics and MSK chiropractors who prioritise building the MSK evidence and becoming more aligned with medicine and allied health professions as compared with the vitalistic (VS) chiropractors who prioritise the formation of new chiropractic institutions and ongoing education and conferences to promote their views. There is evidence that additional self-directed post-graduate education contributes to changes in practice characteristics (Injeyan & Mutasingwa, 2006). If one relates this to the VS group attending seminars and conferences to preserve their philosophy, then this indeed may be a powerful strategy. Brosnan poses the potential of separate futures within chiropractic, based on these polarised factions. Villanueva-Russell (2011) also argued that everyday chiropractors are being silenced by academic elites who have an agenda to push for the MSK model for chiropractic.

A strategy called Organisational or Managerial Change tactics (Diefenbach, 2007) can further explain the process of academic elites silencing others that occurs in professions. Managerial Change Tactics, within any organisation, proposes that due to perceived challenging and hostile environments, there is a threat to the future of an organisation (Diefenbach, 2007). In this instance, this can be seen as the competitive healthcare market – ”the enemy outside”. The managerial elite are also concerned with a perceived enemy inside, seen to resist their “new vision” strategy to advance the organisation, and hence suggest change within an organisation. Using this process to explain chiropractic, the managerial elite would be considered to be academics, political elites and heads of associations with a directive towards the *orthodox*, MSK chiropractic practice objective approach. The hierarchical leadership of both individual associations and international organisations highlight the unwilling *unorthodox* members within the group who resist the new order of an MSK evidence based model of chiropractic. Members of the *unorthodox* group are portrayed as

apathetic, sticking to an invalid old model of academia. The MSK *orthodox* view sees resisting change as unfavourable, regressive and inappropriate (Clegg & Walsh, 2004), while those who resist change, the VS *unorthodox* approach, choose words and orient towards values and theories of more traditional approaches (Suddaby & Greenwood, 2005). A paper in this review highlights the struggle from an *orthodox* perspective remarking that the *unorthodox* group has been said to hold a mix of philosophical, scientific and pseudo-scientific elements towards the evolution of a new healthcare paradigm (Gíslason et al., 2019). Gíslason et al. (2019) further remarks that the internal battle of the polarised paradigms continues to impede progression towards inclusion in a modern multidisciplinary healthcare setting having an impact on chiropractic gaining social and cultural legitimacy.

Organisational change can occur where individuals in power, the managerial elite, create change initiatives, justified and implemented through organisational discourses and politics (Blum et al., 2008; Diefenbach, 2007). Recently, research leaders, members, and the chair of the World Federation of Chiropractic Research Council co-authored a paper suggesting that the centrist group might be responsible for the current state of the profession insofar that their apathy has allowed the traditionalist VS views to continue (Leboeuf-Yde et al., 2019). These leaders also commented further that the centrist group should clearly state their allegiance to either of the polarised factions and for the profession to consider a split (Leboeuf-Yde et al., 2019). In this light, there may be an agenda that CPI is being influenced by Managerial Change Tactics by the political and academic elites. In a time where diversity is celebrated around the world, it is interesting that within chiropractic, separatism is actively being encouraged with diversity being stated to be a weakness rather than a strength (Leboeuf-Yde et al., 2019). Villanueva-Russell (2011) suggested the need for greater involvement by the everyday chiropractor so that their views can be heard. Individuals are capable of transforming structures through their choices, decisions and actions (Yuthas et al., 2004) and change created in context can create shifts in power, influence and status (Hotho, 2008). Perhaps more engagement and involvement of the centrists, the largest group within the profession, could silence the polarised factions that may be the driving force behind this rift.

3.4.4 Under-Representation of VS-Focused Practice Objective

If on face value, approximately 20% of the profession has an exclusive VS-focus (Gíslason et al., 2019; McGregor et al., 2014), with at least 60% who incorporate aspects of VS in practice (Leboeuf-Yde et al., 2005; McDonald et al., 2004; Pollentier & Langworthy, 2007; Smith & Carber, 2008), the proportion of the literature that relates to VS is much less so. This lack of research on subluxation-based chiropractic has even led some to question the existence of VS (Keating et al., 2005). However, there is growing evidence espousing the existence of VS including studies on reliability of subluxation indicators (Holt et al., 2018a, 2018b) and increased emphasis on VS focussed research (Huijbregts, 2016; Russell, 2019). Recently, within the literature there are greater numbers of studies on VS care in patients on improving an array of health presentations and patient outcomes (Christiansen et al., 2018; Haavik et al., 2017, 2018; Holt et al., 2016, 2019).

An apparent theme in the discussion elements of many papers evaluated in this critical review is the emphasis on MSK research and patient outcomes such as back pain and disability. However, research based on the explanatory frameworks and neurological mechanisms of the VS-focussed chiropractic approach that demonstrates positive patient outcomes (Andrew et al., 2017; Daligadu et al., 2013; Haavik-Taylor et al., 2010; Haavik & Murphy, 2012; Holt et al., 2016) are not presented in the discussion, which could imply it does not exist. At times, those that advocate the biomedical MSK model of chiropractic seem contradictory - the importance of a spine-focused identity and MSK intervention approach are highlighted, yet it also seems recognised that chiropractic patients themselves frequently report chiropractic interventions to be effective in additional benefits such as sleep and digestion improvements (Leboeuf-Yde et al., 2005), asthma (Bronfort et al., 2001) and infantile colic (Olafsdottir et al., 2001). It has been reported that up to 15% (Holt & Beck, 2005; Leboeuf-Yde et al., 2005) of patients present for chiropractic care with a non-MSK complaint, supporting the rationale that chiropractic intervention may impact positively on a wide array of presentations not exclusive to MSK complaints. VS-focussed chiropractic care has shown improvement in both MSK and non-MSK conditions as well as patients reporting improvement in aspects of health unrelated to their initial presenting complaint (Russell et al., 2017).

Potentially, CPI may not be best measured as a concept with mutually exclusive sub-categories. As a chiropractor, it may be possible to have a practice objective of relieving a patient's symptomology while also addressing VS – this would not necessarily make one categorise themselves as centrist as it could vary upon individual patient needs. A recent qualitative study showed that the practice objective was patient-centred to improve health and wellbeing including symptom status, and yet was still VS based (Glucina et al., 2019). Forcing individuals to choose one categorisation over another may oversimplify the complicated entity that is professional identity. Professional identity has been found to develop over time (Lordly et al., 2012) and can even occur before formal education (Khalili et al., 2013). Future longitudinal studies are needed to examine this for CPI.

Three of the papers included in this review gave VS as a response option for questions on identifying practice objectives for research that was targeted at practice characteristics and SCOP (Table 3.2) (Leboeuf-Yde et al., 2005; McDonald et al., 2004; Pollentier & Langworthy, 2007). Hence, VS as a practice objective has not been examined extensively. It is noteworthy that researchers may focus on the more obvious treatment questions, although, in clinical practice, deeper discussions around chiropractic philosophies and the chiropractic connection to health and wellbeing may occur in everyday practice (de Souza & Ebrall, 2008), and research questions that relate to these aspects could be explored. VS as a clinical focus has been said to place emphasis on promoting wellness by engaging in positive health practices (Epstein et al., 2009; Kent, 2002; Kent, 2018a). Research such as this, oriented at salutogenic approaches to health, are also gaining popularity in public health and health education (Stellefson et al., 2019).

3.4.5 Study Quality and Limitations

The research that employed surveys (Adams et al., 2017, 2019; Ailliet et al., 2010; Gíslason et al., 2019; Humphreys et al., 2010; Johl et al., 2017; Jones-Harris, 2010; Leboeuf-Yde et al., 2005; Lisi et al., 2010; Malmqvist and Leboeuf-Yde, 2008; McDonald et al., 2004; McGregor et al., 2014; Nielsen et al., 2015; Pollentier & Langworthy, 2007; Puhl et al., 2014; Redwood et al., 2008; Smith & Carber, 2008,2009) had usual but obvious limitations. External validity generalisability issues exist as to whether the findings are applicable to a wider population

than the study sample. Despite often high response rates and sample sizes, potential limitations may also include a recall bias. As being a VS-focused chiropractor or MSK-focussed chiropractor is a contentious issue within chiropractic, a social desirability bias in practitioners' responses may also be present. Non-surveyed and non-responder attitudes and profiles could also affect generalisability. For all papers in this review, no exploration on the strength of the attitudes and beliefs underlying CPI responses were evaluated.

Further to generalisability, the issues of validity and reliability must be considered. Content validity which refers to the degree to which the content of an instrument is an adequate reflection of what is meant to be measured (Mokkink et al., 2010) and face validity, which ascertains whether an instrument appears to measure whatever it is supposed to measure (Hecker & Violato, 2009) were said to take place for a third of the studies in this review (Table 3.1). Many of the papers in this review included adapted questions, which often had not been tested for their psychometric properties. Of further importance, cross-cultural validity (Stevelink & van Brakel, 2013) had not been established for any papers in this review that adapted previous surveys (Gíslason et al., 2019; Humphreys et al., 2010; Johl et al., 2017). Reliability, which has to do with the consistency of measurement at repeated times, was measured in this review only by Chang (2014) who added a duplicate question to test reliability of the survey questions. Factors that influence reliability include unclear or misinterpreted questions (Hecker & Violato, 2009), and ways to further enhance reliability include testing convergent/ discriminant validity, to evaluate the relatedness of concepts across groups or strata (Lohr, 2002). For many of the surveys, limitations could also exist in the lack of definitions for various strata or description of the variables that were assessed. Future studies could explore the relatedness of concepts such as those used in primary care, generalist, specialist, primary contact, spinal dysfunction, VS, MSK specialist, and strata subtypes for practice philosophies.

3.5 Conclusion

Chiropractic professional identity is complicated. Chiropractors have struggled to define their work both within the profession and in parallel to other health disciplines. This review sought to examine what studies have been conducted on professional identity and SCOP. The

number of studies on CPI that are not commentary or narratives are relatively small, and the methodologies are varied. Furthermore, the literature selection was limited to English. The primary author, a chiropractor may also introduce a bias in their evaluation of the articles due to their own epistemological views, which could have influenced the analysis. However, this was mitigated by three other reviewers, two of whom were not chiropractors, also examining the papers in this review.

Articles in this review found that chiropractors had a predominately spine-based MSK practice focus utilising a wide array of interventions. Practicing chiropractors consider themselves to be primary care practitioners with a broad scope of practice not limited to MSK intervention with their care including NMS, non-MSK and organic-visceral practice approaches across multiple patient demographic groups. On the surface, at least 20% of chiropractors have an exclusive VS focus. However, from this critical literature review, it is apparent that VS is an important practice consideration for a much larger proportion of chiropractors, which may be up to 70%. Of the papers in this review, less than half examined philosophical concepts of professional identity, and most papers were centred around categorising practice characteristics and SCOP. There could be a benefit for the profession to explore deeper issues of professional identity, such as how it may change over time, or investigating potential relationships between practitioner clinical confidence, patient outcomes and professional identity.

Much work is still needed to create a coherent objective and contemporary CPI. The marked difference in the concepts evaluated and potential methodological differences have highlighted areas for future development. Further empirical research into the theoretical concepts that underline professional identity and the factors that influence changes in this crucial construct is required. Future recommendations could include studies that use conceptually derived and psychometrically robust instruments capable of detecting the subtle changes in the construct over time. Further research is needed to better understand the tensions between personal and professional values and the role of workplace learning on professional identities. It is crucial that the understanding of chiropractors' professional identity is not limited to the undergraduate identity of students, academic directive, or leaders of the professions. Comprehensive exploration to discover specific practice settings that meet the daily demands of the practicing chiropractor is paramount. An adequate

understanding of professional identity must include the diverse contexts in which chiropractors conduct their practice, such as family care, sport performance or acute/chronic injuries and health conditions. After all, it is the everyday chiropractor in everyday practice settings that are the ground forces that have led to the high patient satisfaction rates that the profession prides itself on. Further empirical work on CPI is needed to guide and inform chiropractic education, as well as serving to inform political groups and guide policy direction. Through continued focus and exploration of evolving chiropractic professional identity, a more coherent identity may be possible, which could involve celebrating and embracing its diversity.

Chapter 4: Defining Chiropractic Professional Identity: A Concept Analysis

Prelude

The professional discourse surrounding chiropractic has been largely dominated by debates and disagreements between various factions and subtypes, which often centre on differences in practice philosophies and orientations. However, these arguments have proven to be repetitive and ineffective in advancing the profession as a whole. To move forward, it may be more productive to shift the focus to identifying commonalities among chiropractors and uncovering the shared elements that make up their professional identity. This approach could help bridge the gaps between different factions and promote a more cohesive professional community.

This chapter, a published article in the *Journal of Bodywork and Movement Therapy*, aims to fulfil the second objective of this thesis project. The aim of this research is to understand the components of and formulate a definition of CPI.

4.1 Introduction

The term *professional identity* is frequently used across many disciplines. A lack of a clear definition can lead to assumptions and misunderstandings and a potential superficial evaluation of this important concept (Fitzgerald, 2020). Since its inception, the chiropractic profession has had much rhetoric and continual disagreement surrounding its identity, which may be due to a lack of a coherent definition of CPI (Glucina et al., 2020). The identity debates have permeated through all echelons within the profession, from institutional directives and academics (Brosnan, 2017), leaders of organisations (Duenas et al., 2003), through to the everyday practicing chiropractor (Smith & Carber, 2009); but to what effect? The discourse has not unified the profession, and some would argue that chiropractic is at a crossroads (Leboeuf-Yde et al., 2019; Simpson & Young, 2020; Villanueva-Russell, 2011). Despite these warnings, remarkably, little empirical work has been conducted on CPI.

The bulk of chiropractic professional disunity is linked to the multifaceted professional identity, tied to chiropractic philosophy and practice approaches (Brown, 2016; Gliedt et al., 2021; Mootz, 2001). The debate has primarily surrounded upon the two historically polarised vitalist (long-term wellness-based, VS-focussed) and MSK (short-term, biomedical functional rehabilitative focussed) approaches. There is also a large group of chiropractors who encompass aspects of both ideologies, the centrists (Cooper & McKee, 2003; Glucina et al., 2020; Good, 2010). Due to differing distinctions on group characteristics, composition of subgroups remains unclear. A recent study found that 57% of chiropractors were spine and neuro-musculoskeletal focused, 22% were primary care focused and 21% were VS-focused (Gliedt et al., 2021).

Research has also shown that VS group comprises at least 20% of the profession, and that as VS is an important practice consideration for up to 70% of chiropractors (Glucina et al., 2020), approximately half of chiropractic professionals may belong to the centrist group. The effect of the political infighting has been seen to affect chiropractors' ability to both market and communicate to the public about its potential benefit, therefore creating uncertainty in how to frame chiropractic in the right paradigm to their patients (Glucina et al., 2020; Myburgh & Mouton, 2007). The internal strife has also been shown to impact the progression of chiropractic within interdisciplinary health settings (Myburgh & Mouton, 2007). For the chiropractor, the political disharmony has been shown to affect chiropractors' confidence, esteem, and professional satisfaction (Glucina et al., 2019).

Related manual therapies outside of chiropractic have battled similar 'identity crises', which have sparked researchers to formulate definitions of professional identity, such as within osteopathy (Clarkson & Thomson, 2017), physiotherapy (Hammond et al., 2016) and allied health and social care (Adams et al., 2006). Specifically, in osteopathy, it has been shown that a clear identity increases confidence in practice, enhances wellbeing, and promotes career success (Clarkson & Thomson, 2017).

Greater clarity on the constructs that characterise CPI and the resultant creation of potential definitions may assist in the development of a measurement assessment tool, which could provide a platform for the profession to move forward (Glucina et al., 2020). A coherent understanding of the CPI concept may facilitate recognising the degree, development, and

evolution of CPI. Thus, this research aims to create a coherent definition of CPI and to formalise its conceptual domains. A concept analysis approach was conducted to inform the formulation and refinement of the constructs and domains that comprise CPI.

4.2. Methodology

A concept analysis clarifies a vaguely defined notion by dissecting it into smaller elements (Foley & Davis, 2017). Several strategies of concept analysis exist, with the eight-step method developed by Walker and Avant (2005) being the most frequently cited and was employed in this research. This methodology includes concept selection, determination of the aims/purposes of analysis, and identification of all possible uses of the concept (CPI). Defining attributes of CPI are identified where model, borderline, and contrary cases are used to highlight what both CPI is and is not. Finally, the antecedents needed to generate CPI, the consequences of embodying a strong CPI, and methods for referring to or measuring CPI empirically are identified and evaluated.

4.2.1. Concept Selection

According to Walker and Avant (2005) concepts chosen should be based on relevance to research or practice. The concept of CPI was chosen as it has been found to lack a clear definition (Ebrall, 2020; Glucina et al., 2020). However, the importance of a strong professional identity is paramount. It is known to enhance a profession's recognition in society (Hotho, 2008), provide a sense of stability and belonging and enhance self-esteem (Barbour & Lammers, 2015; Hotho, 2008)and improve professional satisfaction and success (Skorikov & Vondracek, 2011).

4.2.2. Aims/Purpose of the Concept Analysis

Concept analysis identifies the existing theoretical strands that define a concept of interest and knots them together to form a more robust, more coherent theory. This has the potential to guide clinical practice, ultimately benefiting the broader society by promoting

health and wellbeing (Penrod & Hupcey, 2005). The purpose of concept analysis is to clarify a concept and determine and integrate its existing body of knowledge to produce a higher-level understanding of the of interest (Hupcey & Penrod, 2005; Nuopponen, 2011).

A well-developed concept of CPI can advance the discipline of chiropractic and enhance the development of theory. Comparatively, studies with a poorly developed concept face serious threats to validity (Hupcey & Penrod, 2005). The end product of concept analysis often includes producing operational definitions (Nuopponen, 2010a, 2010b), which is the aim of this research. The strategies employed include examining inter-disciplinary literature to inform the global state of the shared science surrounding the concept of professional identity (Penrod & Hupcey, 2005).

4.2.3. Identification of all Possible Uses of the Concept

To the authors' knowledge, there is currently no known definition of CPI. Thus, initial exploration of the chiropractic professional identity concept was accomplished through a critical literature review approach (Grant & Booth, 2009). This method was chosen as the topic is broad, and an umbrella approach using research from health-related disciplines could be applied to capture the essence of the concept of CPI.

International literature was searched from widely used online search engines and databases, including AMED (Allied and Complementary Medicine), CINAHL Complete (via EBSCO), Dentistry & Oral Sciences Source, Index to Chiropractic Literature, MEDLINE, SocINDEX with Full Text, and SPORTDiscus with Full Text. The keywords used were *professional identity*, in the title, *concept** in the abstract, and *healthcare* as a subject, in a search for research conducted between January 2000 to June 2021. Duplicates were removed, and those not attainable in the English language were excluded. Reference lists were also reviewed to identify additional relevant articles. The primary purpose of the search criteria was to ascertain definitions of professional identity. As part of the Walker and Avant (2005) approach, dictionary definitions are also used to inform a concept analysis, and in this review, definitions were obtained from current online dictionaries.

4.3 Results

4.3.1. Dictionary definitions

The online Merriam-Webster Dicitionary (2021) has no exact definition of *chiropractic professional identity* or *professional identity*. Thus, the terms *chiropractic*, *professional* and *identity* will be compared as shown in Table 4.1, with definitions taken from the World Health Organisation (2005) and the online dictionary sources of Merriam-Webster Dictionary (2021), and The Free Dictionary (Farlex, 2021). The above dictionary definitions of the separate term's *chiropractic*, *professional*, and *identity* contain commonalities. In summary, chiropractic is a unique system of healthcare that works with the neuromusculoskeletal system to effect health. As a professional, these learned practitioners hold their field expertise that conforms to ethical obligations and standards for which they receive payment. Concerning identity, a chiropractic practitioner encompasses both the actions per-formed and how the individual behaves, as well as the actual care provided.

4.3.1.1. Literature review

The CPI concept is often alluded to in several ways, however, is not explicitly defined. Chiropractic professional identity is often discussed in terms of philosophical ideology and foundational theories. This has historically centred around the debate of the vitalistic and musculoskeletal approaches to patient care (Mootz, 2001; Schneider et al., 2016) and the conflict that it creates in the progression of the profession from the perspective of students, practitioners and integration into the multidisciplinary collaborative healthcare arena (de Luca et al., 2018; Gíslason et al., 2019; Swain et al., 2021). Some explicit identity statements propose the purpose of chiropractic and what it provides (Institute for Alternate Futures, 2013; Nelson et al., 2005; Palmer College of Chiropractic., 2021), but there is no clear definition of CPI.

Notably, a recently published paper by Ebrall (2020) provided the following framework of CPI; the chiropractic profession includes a body of knowledge/science, and that as a group, the profession is made of people engaged in and qualified in that knowledge, regulated by

Table 4.1

Definitions of terms "Chiropractic", "Professional" and "Identity"

Definition source and term	World Health Organisation (2005, p.3)	Merriam Webster Dictionary (2021)
Chiropractic	A health care profession concerned with the diagnosis, treatment and prevention of disorders on the neuromusculoskeletal system and the effects of these disorders on general health; there is emphasis of manual techniques used such as joint adjustments and/or manipulation, with particular focus on subluxation	A system of non-invasive therapy which holds that certain musculoskeletal disorders result from nervous system dysfunction arising from misalignment of the spine and joints and that focuses treatment especially on the manual adjustment or manipulation of the spinal vertebrae
Definition source and term	The Free Dictionary (2021)	Merriam Webster Dictionary (2021)
Professional	• [O]f, relating to, engaged in, or suitable for a profession; Conforming to the standards of a profession • Engaging in a given activity as a source of livelihood or as a career • Performed by persons receiving pay • Having or showing great skill; expert	• [O]f, relating to, or characteristic of a profession; engaged in one of the learned professions; characterised by or conforming to the technical or ethical standards of a profession; exhibiting a courteous, conscientious, and generally business-like manner in the workplace • Participating for gain or livelihood in an activity or field of endeavour often engaged in by amateurs; having a particular profession as a permanent career; engaged in by persons receiving financial return • Following a line of conduct as though it were a profession
Identity	• [T]he condition of being a certain person or thing; the set of characteristics by which a person or thing is definitively recognisable or known; the awareness that an individual or	• [T]he distinguishing character or personality of an individual; the relation established by psychological identification • The condition of being the same with something described or asserted

group has of being a distinct, persisting entity • The fact or condition of being the same as something else	• Sameness of essential or generic character in different instances; sameness in all that constitutes the objective reality of a thing

codes of ethics, standards of practice and professional conduct. Another outline of CPI proposes that chiropractors are research-focused, well--educated, primary care providers that focus primarily, but not exclusively on the spine, embracing a model of holistic, preventive medicine through safe adjustments based on neurological imbalance requiring a diagnosis (Rosner, 2016).

4.3.2 Professional identity across disciplines

This lack of a CPI definition contrasts markedly with other health professions which have a vast array of broad and discipline-specific definitions and descriptions of professional identity (Table 4.2). Broadly, characteristics include the attributes, skills and functions; actions and behaviours; knowledge; values, beliefs and ethics; personal identity, group identity and socialisation; and the influence of the context of care (Fitzgerald, 2020). Table 4.2 highlights a cross-section (listed in order by year of publication) of definitions and descriptions of professional identity from various health-related disciplines.

This step is considered the heart of concept analysis and involves finding characteristics and clusters of attributes frequently associated with the concept (Walker & Avant, 2005). Table 4.2 highlights the main attributes across various other healthcare professions.

Table 4.2

Health-Related Definitions and Attributes of Professional Identity

Reference	Discipline	Definition or description of professional identity	Attributes
Adams et al. (2006)	Allied Health and Social Care	"Attitudes, values, knowledge, beliefs and skills that are shared with others within a professional group and relates to the professional role being undertaken by the individual" (p.56)	• Attitudes • Values • Knowledge • Beliefs • Skills
Wilson et al. (2013)	Medicine	A complex structure that the individual uses to link their motivations and competencies to their career role; the development of professional values, actions, and aspirations; an ongoing process of self-reflection on the identity of the individual	• Career role • Motivations • Competency • Values • Actions • Future thinking • Self-reflection
Woo et al. (2014)	Counselling	"Understanding one's roles and responsibilities as a counselling professional, the sense of pride and satisfaction in one's chosen field, and presenting the profession" (p.11)	• Roles • Responsibilities • Pride • Satisfaction • Expectations
Hammond et al. (2016)	Physiotherapy	The construction of beliefs, values, and motives and meaning of being a physiotherapist within intra and inter-	• Beliefs • Values • Motives • Expectations

		professional communities.	
Clarkson & Thomson (2017)	Osteopathy	The construction of a person's thoughts and beliefs around their approach to patients, the osteopathic profession, learning experience and practice skills that define their professional role	• Beliefs • Values • Pride • Expertise
Dadich & Doloswala (2018)	General Practitioners	Professional autonomy and awareness of the role and functions that one performs or is expected to perform in a social context as a member of their profession	• Roles • Functions • Expectations • Professional autonomy
Baskwill et al. (2020)	Massage therapists	The values and beliefs constructed by professional motivation, confidence and competence, therapeutic relationship, individualised care, philosophy of care, patient empowerment, and a desire to be recognised for their role within the healthcare system	• Values • Beliefs • Motivations • Confidence • Competence • Therapeutic relationship • Patient-centred • Societal acceptance • Philosophy
Haghighat et al. (2020)	Nursing	Profession related professional self-perception based on attitudes, beliefs, feelings, values, motivations, and experiences	• Attitudes • Beliefs • Feelings • Values • Motivations

4.4. Attributes

The most relevant CPI-related attributes are called *domains*. These include knowledge and understanding of *professional ethics and standards of practice, chiropractic history*, *practice philosophy and motivations*, the *roles and expertise of a chiropractor*, *professional pride and attitude,* and *engagement and interactions* (Figure 4.1 and Table 4.2). Individual CPI domains can also be made up of many parts that are called *elements*. Examples of where these have been evaluated in chiropractic research are provided in Table 4.3. For this concept analysis, domains, attributes, and elements of CPI have been derived from professional identity and chiropractic literature.

Figure 4.1

Domains of Chiropractic Professional Identity

Table 4.3

Domains and Elements of Chiropractic Professional Identity

Chiropractic Professional Identity Domain	Elements from Professional Identity literature	Chiropractic examples
Ethics and standards of practice	Values, beliefs, and ethics are most often cited as essential attributes of professional identity (Fitzgerald 2020).	• Scope and boundaries • Law/jurisprudence • Principles of professionalism • Competency (Kent, 2018a; Kinsinger & Soave, 2012).
Practice philosophy and motivations	How the profession is differentiated from other groups (Goldie, 2012; Norris, 2001).	• Vitalism • Evidence-based practice Lexicon • Practice subtypes (de Luca et al., 2018; Glucina et al., 2019, 2020; Good, 2012; Institute for Alternate Futures, 2013; Russell, 2019; Swain et al., 2021).
Roles and expertise	What professionals know, their specialised knowledge and skills. The stronger the identification with the activities and actions, the greater the professional identity and the stronger the job satisfaction (Fitzgerald, 2020; Woo, 2014).	• Prevention • Wellness • Empowerment • Patient-centred care, Scope of practice • Place in healthcare (Chang, 2014; Davis & Bove, 2008; Ebrall, 2020; Hawk et al., 2007; Hawk & Evans, 2013; Pollentier & Langworthy, 2007; Redwood & Globe, 2008).
Pride and attitude	When there is a strong identification with the group, self-identification as a professional is strengthened; identity is not always stable and can be impacted by surrounding historical, political and cultural	• Tension from cultural and historical roots • Future focus • Marketability • Public image • Positive work-life affect • Job satisfaction • Self-esteem • Confidence

	realities (Molleman & Rink, 2015; Thompson et al., 2018).	(Alcantara et al., 2021; Brosnan, 2017; Glucina et al., 2019; Good, 2016; Myburgh & Mouton, 2007; Villanueva-Russell, 2011; Williams, 2011).
Engagement and interactions	Through shared behaviour, individuals are acknowledged as a member of a profession; socialisation facilitates professional growth (Norman 2015; Wackerhausen 2009).	• Participation in leadership Participation in research • Association membership • Community service • Conference attendance • Peer interaction and collegiality • Commitment • Advocacy • Mentoring • Belonging (Alcantara et al., 2021; Hawk et al., 2007; Lisi et al., 2014; Williams, 2011).
Chiropractic history	Having a deep knowledge and understanding of a profession provides insight into what it means to become and be a member of that profession (Emerson 2010).	• Knowledge of foundational theory • Seminal chiropractic history (Rosner, 2016; Senzon, 2011).

At times, domains can overlap, whereby a construct/concept may encompass several attributes. A recent review by Glucina et al. (2020) on contemporary CPI, demonstrated the variation among practicing chiropractors in how they viewed themselves as service providers (e.g., primary care generalist), in wider healthcare categorisations (e.g., CAM vs Integrated provider) in their scope of practice concerning patient demographics (e.g., family vs acute care) and with their chosen modalities (e.g., adjustment vs prescriptive rights). The variation of these self-classifications shows overlapping views in the CPI attributes of the *roles and expertise* that a chiropractor undertakes and *ethics and standards of practice* and *philosophy and motivations* of how they practice. This study uncovered that chiropractors view their identity within subtypes of epistemological orientations to patient care (e.g., centrist or vitalist), which in terms of CPI would be analogous to reflecting variations in the overlapping domains of *chiropractic history* and *practice philosophy and motivations*.

Professionals update their skill set following developments in principles and practice, research, standards and ethics. In the literature, conflict has been noted between a chiropractor's personal values and the ideology of holistic care, moving communities towards a new healthcare paradigm compared with condition-based care and offering the services that the patients seek (Mootz, 2001). This tension encompasses the CPI domains of *roles and expertise*, *practice philosophy and motivations*, *knowledge and understanding of professional ethics and standards of practice*, *chiropractic history*, *practice philosophy and motivations*, the *roles and expertise* of a chiropractor and *professional pride and attitude*.

There is great debate on the role of prescribing rights, the chiropractic adjustment/manipulation, integration into collaborative healthcare, and the need to focus on evidence-based practice (Nelson et al., 2005). Further to this, there has been much discussion on the role of a chiropractor functioning as a specialist (having a more concentrated and deeper knowledge of a narrower range of conditions) or as a generalist (having knowledge of a broad range of conditions) (Nelson et al., 2005; Schneider et al., 2016). These matters comprise the over-lapping CPI domains of *roles and expertise* of a chiropractor, *practice philosophy and motivations*, *attitudes and professional pride*, and *ethics and standards of practice*.

Chiropractors, as health professionals, require rigorous standards of practice and are expected to make recommendations that are in the best interest of the patient (Nelson et al., 2005). The chiropractic profession follows other health professions in the modern healthcare arena and emphasises educating communities on the importance of injury prevention and health promotion (de Luca et al., 2018; Hawk & Evans, 2013; Johnson & Green, 2009; Nelson et al., 2005; Redwood & Globe, 2008). This approach could be categorised into the *roles and expertise* that a chiropractor undertakes whilst also reflecting their *engagement and interactions*, *practice philosophy and motivations*, as well as professional *ethics and standards of practice*.

4.5 Model Case

A model case is an example that represents a real-life example that may be fictional or literature-based, that includes all attributes of the concept (Walker & Avant, 2005). The

following fictional example describes an ideal model scenario for an individual that embodies a strong CPI.

Ms. J, a chiropractor who graduated 5-years ago, is attending a national chiropractic conference on patient-centred care. Jamie is spear-heading a community initiative to educate the community on how *chiropractic benefits performance* and is delivering a short presentation to help others educate their communities on this topic. In this presentation, Ms. J discusses how the integrated practice she is a part of ethically co-manages the sports teams they collaboratively work with. These top athletes seek all forms of care, from acute rehabilitative care through to prevention of injuries and maintenance of overall health and wellness.

Ms. J, a proud chiropractic advocate, sees people of all ages and stages of life; her practice is at capacity. To help pass on the extra patient volume, Ms. J is mentoring new graduates that have recently joined the group practice. Her clinical focus is embedded in the foundational vertebral subluxation-based roots of chiropractic; however, she has a pragmatic care approach, encourages nutritional support, and has a public health focus. Jamie supports the diversity within the profession and welcomes all approaches when there is a better fit for the patient. She regularly refers patients to her chiropractic colleague Mr. K, who has a different practice emphasis and patient management focus. Whilst Ms. J is aware of the historical conflicts within the profession, she sees the possibilities and feels there is no lack of bright minds to facilitate a robust future for chiropractic.

This example encompasses all defining attributes of a strong chiropractic professional identity. Ms. J's knowledge gained from her education has served her to be actively involved with and share knowledge within her profession and inter-professionally. Her commitment to her discipline, with a modern welcoming pragmatic and integrative approach, is exemplified in how she acts and behaves, both within and outside her practice. This has been developed by Ms. J's personal practice philosophy that fits her values and beliefs, and in her mind, helps to better the health of the community and greater society.

4.6 Borderline and Contrary Cases

A borderline case exemplifies most of the elements of the concept but may differ significantly in one or more attributes, whereas a contrary case is an example of what the concept is not (Walker & Avant, 2005). The following fictional cases reflect these.

Borderline case: Mr. P, a well-performing recent graduate, is also at the conference Ms. J is presenting at. Mr. P has no wish to be there and could think of nothing worse than sitting through another chiropractic presentation. However, he has to attend to complete continuing professional development hours to retain board registration.

Mr. P enjoys aspects of being a chiropractor and, in particular, enjoys family care, but the political and philosophical infighting has dulled his enthusiasm; he would rather just see patients and not get involved. He makes a good enough living and knows his practice has much room for growth but feels that his principal chiropractor, that he is an associate for, is mentoring him well. Mr. P feels he is gaining new skills all the time. Mr. P recently attended a paediatric seminar on how to assess and care for under 5-year-olds. He is excited to see more kids but is anxious that the political turn to specialist-only care will inhibit him from doing so.

This example portrays a borderline scenario as Mr. P has many aspects of a strong CPI, but not all. Although Mr. P has graduated, albeit, from a floundering institution, he considers himself to be performing well which may reflect a strong pride and attitude domain. However, Mr. P exhibits some anxiety for the profession's future, which may relate to confusion around the domains of *roles and expertise* and *practice philosophy and motivation*. This may also be due to contributing effects of the *chiropractic history* domain as historically, the profession has been divided. Due to these factors, Mr. P may not be as connected to the profession as possible, which could reflect/impact the *engagement and interactions* domain. This borderline case can be compared to the case of Ms. C, a contrary case for this concept analysis as follows:

Ms. C, a graduate of almost 20 years, received the flyer for the conference but had no intention of going. Ms. C has not completed any continuing professional development for some time and is not bothered if she gets audited. If so, she will just make it up or just stop being a chiropractor altogether. Ms. C wishes she never became a chiropractor and is

disenfranchised with the whole profession. When people ask her what she does, she is vague. If people press on, she says she is kind of like a physiotherapist.

She thinks chiropractors should treat people's symptoms in the shortest amount of time possible, preferably the first time. However, the underlying reason for this is that after such a long time in practice, Ms. C is simply just sick of people complaining about their pain, and she is just 'over people'. Lately, patients have been coming to her to get time off work; Ms. C just inflates her fee and writes up the medical certificate without even clinically assessing the patient.

Ms. C does not represent any of the defining attributes and domains of a strong CPI. Ms. C exhibits no pride or functions of a chiropractor and has almost given up entirely.

4.7 Antecedents and Consequences

This step identifies those events that must occur prior to (antecedents) or because of the occurrence of (consequence) the concept (Nuopponen, 2010a, 2010b). Antecedents of professional identity have been identified to include responsibility, confidence, autonomy, clinical judgement, the ability to collaborate, and organisational resources and structures that, when missing, make it difficult or even impossible to develop a healthy professional identity (Rasmussen et al., 2018). Additionally, professional identity has been said to be informed by patients and is mediated by workplace and institutional discourses and organisational and jurisdictional boundaries and hierarchies (Hammond et al., 2016).

In most cases, initial requirements to become a chiropractic professional include graduating from an accredited institution and having a state or country (dependant on where the practitioner will be practicing) licensure examination to become registered. Regulatory boards in each state, region, or country establish and oversee the legal requirements that applicants must meet before becoming licensed (National Board of Chiropractic Examiners, 2023). These examinations include clinical and diagnostic assessment, patient management protocols, standards of practice, and codes of ethics. Professional identity has been said to begin with formal education and has been researched with undergraduate chiropractic students. Common themes of an interplay between students' professional association

membership status, pre-chiropractic education, and institutional philosophy have been cited as being determining factors to identity construction (de Luca et al., 2018; Gliedt et al., 2012; Swain et al., 2021).

The consequences of poor professional identity are numerous and impact individual practitioners and their patients through to the broader public. Professional identity discrepancies within the profession and from the public create role ambiguity and role stress and have been posed to lead to increased emotional exhaustion and depersonalisation and reduced personal accomplishment, which contributes to burnout amongst its members (Williams, 2011).

Strong professional identity facilitates the taking up of professional responsibilities (Crossley & Vivekananda-Schmidt, 2009), promotes a sense of belonging and professional socialisation (Chin et al., 2020), increased competence (Myers et al., 2002) fosters greater belonging, stability, and esteem (Hotho, 2008), and promotes enhanced decision making and confidence (Sawatsky et al., 2020). These have been shown to enhance trust and patient safety (Heldal et al., 2019) and ultimately lead to better practice and patient outcomes (Molleman & Rink, 2015; Rasmussen et al., 2018).

4.8 Defining Empirical Referents

Empirical referents provide ways to see and measure CPI. To date, there is no formal instrument that can be used for students and chiropractors alike to assess this concept. A valid measure of professional identity can be a powerful prompt for development, self-reflection, and self-monitoring (Eva & Regehr, 2008).

Within the broad realm of professional identity, many tools are used to assess and screen for professional identity. These can be applied in general healthcare such as the Professional Self Identity Questionnaire (PSIQ) (Crossley & Vivekananda-Schmidt, 2009), or can be discipline-specific such as the Nurses Self-Concept Questionnaire (Cowin, 2001), or the Professional Identity Scale in Counselling (PISC) (Woo & Henfield, 2015).

In the future, CPI may be operationalised with an instrument developed to assess this concept further. This could foster enhanced interprofessional collaboration, improve

chiropractic education and continued professional development, and facilitate intra-professional unity through understanding similarities and differences amongst factions of the profession (Glucina et al., 2020).

4.4 Discussion

Professional identity is essential across many healthcare professions; however, there remains a lack of a generic agreed-upon definition, and across disciplines, definitions can vary. The absence of a definition, such as in the case of the chiropractic profession, can lead to inconsistent use of the term and a vague notion of the concept, which may lead to miscommunication of research findings (Fitzgerald, 2020; Glucina et al., 2020). Until now, professional identity in chiropractic has not been comprehensively defined.

This concept analysis uncovered six broad attributes: knowledge and understanding of professional ethics and standards of practice, chiropractic history, practice philosophy and motivations, the roles and expertise of a chiropractor, professional pride and attitude, and engagement and interactions. From these, the following definition could be derived; chiropractic professional identity is "A chiropractor's self-perception and ownership of their practice philosophies, roles and functions and their pride, engagement, and knowledge of with their profession".

The knowledge of the domains that make up CPI from this current research could facilitate the operationalisation of CPI. These domains could aid in constructing a conceptually derived and psychometrically robust instrument, able to quantify this concept for use in research.

A common understanding and a common language for CPI may promote future research and assist in a more cohesive view of chiropractic identity formation. This could lead to introducing future work-place learning programmes that include all components of professional identity development formation (Chin et al., 2020), and could also promote postgraduate continued professional development. Increased knowledge on what makes up professional identity can also lead to more reflective practice (Phillips et al., 2002), which can increase job satisfaction and reduce burnout. Future CPI studies could be undertaken in

the contextual scope of diverse practice foci, such as interprofessional collaborative care or daily general chiropractic practice.

Strengths of using a concept analysis approach include giving meaning, developing, classifying and refining a concept that is not well defined to transform an abstract idea into a more tangible concept (Botes, 2002; Foley & Davis, 2017). However, limitations must also be acknowledged. Complex concepts may have interwoven abstract behavioural, cognitive and emotive meanings whose meaning may be difficult to untangle as a discrete concept and hence may require ex-amination from multiple theoretical frames to derive insights (Penrod and Hupcey, 2005). Additionally, the lack of empirical investigation through quantitative research methods to clarify concepts, may result in limitations in the methodology of concept analysis (Botes, 2002). It has also been postulated that a derived conceptualisation may lack depth, rigour or replicability (Beckwith et al., 2008) and may represent the probable and not an absolute truth of a concept (Penrod and Hupcey, 2005). The utility of the results generated from the present concept analysis thus needs to be explored further, using a variety of different research approaches and ways to include the voice of the community of chiropractors.

4.5 Conclusion

A strong professional identity is known to enhance a profession's recognition by society, promote practitioner confidence and professional satisfaction and may have the potential to improve patient out-comes. This concept analysis provided a common language for research by creating a definition of CPI, clarifying its domains, and extending the understanding of professional identity for the chiropractic profession. Furthermore, a definition may help to foster consistent and supported development of professional identity.

This concept analysis derived the definition of CPI from being: "A chiropractor's self-perception and ownership of their practice philosophies, roles and functions, and their pride, engagement, and knowledge of their profession". A conceptual definition of CPI may bring together members and groups within the profession and promote intra-professional understanding across other disciplines. Knowledge of CPI could be used as a platform for

future research for its operationalism and measurement, which could examine any effects on patient outcomes.

4.6 Clinical Relevance

Inter-disciplinary professional identity literature has found that a clear identity increases confidence in practice, enhances wellbeing and self-esteem, and promotes career success and improve professional satisfaction and success, improve patient outcomes, and enhance a profession's recognition in society.

Once a practitioner is aware of the strength or where their professional identity may be lacking, they could focus their resources on these areas to assist them in becoming a better chiropractor.

Greater clarity on CPI constructs may assist in operationalization of this concept through the development of a measurement assessment tool. A valid measure of professional identity can be a powerful prompt for development, continuing professional, self-reflection, and self-monitoring to facilitate in greater patient outcomes.

Chapter 5: Development and Validation of the Chiropractic Professional Identity Embodiment Scale (CPIES)

Prelude

The chiropractic profession faces identity challenges stemming from differences in practice beliefs, philosophies and practice styles among factions or subtypes of chiropractic practitioners. Recent research suggests that practitioner subtypes alone may oversimplify the multifaceted concept of CPI. Instead, a framework comprising six broad domains has been proposed to better represent this construct. Notably, currently there is no instrument within the field of chiropractic that measures one's professional identity. Therefore, this research aims to develop a robust psychometric instrument capable of capturing core elements common to all chiropractors.

The past decade has seen a significant increase in research on professional identity, along with the development of instruments and scales for measurement. These tools play a crucial role in understanding professional identity dynamics and their implications. This chapter, published as a paper in the journal *Complementary Therapies and Clinical Practice*, outlines the steps and processes involved in creating (Appendices 3-8: Consent forms and Participant Information Sheets), developing (Appendices 9), and validating the Chiropractic Professional Identity Embodiment Scale (CPIES).

5.1 Introduction

Professional identity is a multifaceted concept that transcends mere affiliation with a particular profession, and involves a complex interplay of individual beliefs and perceptions (Barbour & Lammers, 2015). Chiropractic, defined by the World Health Organisation as "a health care profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health;

there is emphasis of manual techniques used such as joint adjustments and/or manipulation, with particular focus on subluxations" (World Health Organisation, 2005, p.3), faces an ongoing lack of clarity surrounding its role within the broader healthcare landscape (Leboeuf-Yde et al., 2019; Wiggins et al., 2022). Disagreement persists on what characterises the chiropractic profession, its philosophy, and scope of practice (Chang, 2014; Russell, 2019; Villanueva-Russell, 2011).

The identity crisis extends beyond external perceptions, impacting chiropractors themselves, who grapple with the unclear public identity of the profession due to contrasting practice styles (Glucina et al., 2019; Myburgh & Mouton, 2007). Despite commentary from chiropractic researchers and academics on the profession's ongoing struggle to define its identity (Brown, 2016; Good, 2016; Hart, 2016; Nelson et al., 2005; Rosner, 2016; Schneider et al., 2016), attempts to bridge divergent approaches have been met with contention (Briggance, 2005; Villanueva-Russell, 2011), and remain unresolved (Brosnan, 2017; Brosnan & Cribb, 2019). Debate continues to revolve around categorisation of chiropractic professionals into subtypes relating to philosophical and therapeutic orientations in patient care (Carey et al., 2005; Gliedt et al., 2021; Glucina et al., 2020; McGregor et al., 2014; Meeker & Haldeman, 2002; Swain et al., 2021). Recent research by Glucina et al. (2023) revealed that practitioner subtypes alone may oversimplify the rich concept of chiropractic professional identity (CPI). revealed that practitioner subtypes alone may oversimplify the rich concept of chiropractic professional identity (CPI). Exploring the field of professional identity across numerous disciplines through a concept analysis, six overarching domains were found to constitute CPI: (1) knowledge of professional ethics and practice standards, (2) chiropractic history, (3) practice philosophy and motivation, (4) chiropractor roles and expertise, (5) professional pride and attitude, and (6) professional engagement and interaction behaviours. This multi-dimensional framework serves as the foundation for this study.

Chiropractic professional identity has been defined by Glucina et al. (2023; p.80) as "a chiropractor's self-perception and ownership of their practice philosophies, roles and functions, and their pride, engagement, and knowledge of their profession". In this context, it is crucial to recognise the enduring schism between Vertebral Subluxation (VS) and Musculoskeletal (MSK) treatment-focused chiropractors, a division with deep- rooted

conceptual differences, potentially hindering the profession's advancement (McDonald et al., 2004). Broadly, chiropractors impact the neuromusculoskeletal system, while the focus of VS chiropractors centres on evaluating and addressing biomechanical derangements of the spine, which are assumed to be caused by bodily stressors, producing clinically significant maladaptive effects on neurological function and sensorimotor integration (Henderson, 2012; Taylor & Murphy, 2010). In contrast, MSK treatment-focused chiropractors prioritise improving dysfunctional joints through mobilisation to alleviate pain (Schneider et al., 2016). A third, "centrist", group of chiropractors incorporates elements of the traditional VS-focused chiropractic philosophy, while concurrently addressing general MSK complaints (Good, 2010; WFC Task Force Presentation, 2005). Research examining chiropractic practice orientation subtypes has employed diverse methodologies. Some studies (Gíslason et al., 2019; Gliedt et al., 2021) applied subtype categorisations proposed by McGregor et al. (2014). In this Canadian study, the majority (81.2%) of chiropractors belonged to the *orthodox*, mainstream MSK evidence-based category, while the remaining 18.8% were classified as *unorthodox* or traditional VS-based chiropractors (McGregor et al., 2014). Using these categorisations, a European study reported that 79.9% of chiropractors were *orthodox,* leaving 20.1% in the *unorthodox* category (Gíslason et al., 2019). In the United States, Gliedt et al. (2021) adapted the McGregor et al. (2014) framework creating three mutually exclusive chiropractic subgroups, with results indicating that 21.2% identified as VS-focused, 56.8% as spine/neuromusculoskeletal focused, and 22% as a "healthy life doctor" or general primary care-focused chiropractic subgroup. Chiropractic students' perspectives on subtypes and categorisations have shown significant variability, often quantified through percentages reflecting agreement with specific attitude statements (de Luca et al., 2018; Gliedt et al., 2015; Swain et al., 2021; Wouters et al., 2022). Practice orientation subtypes contribute to discord within the profession, potentially hindering its unity (Leboeuf-Yde et al., 2019; Villanueva-Russell, 2011). Chiropractors adhering to traditional VS beliefs may pose barriers to the legitimisation of chiropractic within wider healthcare (Gliedt et al., 2021). The prevailing narrative within chiropractic academia advocates an evidence-based approach, emphasising the management of MSK disorders for a limited range of conditions, as championed by the MSK-focused proponents (Johnson et al., 2018; Schneider et al., 2016). The MSK approach is credited by some with making the profession more accountable, scientifically based, and grounded in academic research to improve clinical service efficacy

and safety (Hartvigsen et al., 2018; Schneider et al., 2016). In contrast, VS chiropractors, according to proponents of the MSK-focused approach, do not align with evidence-based practices and could impede mainstream chiropractic progress (Axén et al., 2020). Nevertheless, scientific research conducted by chiropractors investigating VS in basic and clinical science is largely overlooked by MSK-focused advocates (Glucina et al., 2020).

Professional identity instruments have been developed in various health-related disciplines such as nursing [e.g. Nurses Self-Concept Questionnaire; (Cowin, 2001)], counselling [e.g. Professional Identity Scale in Counselling; (Woo & Henfield, 2015)], physicians [e.g. Development Scale; (Tagawa, 2020)] and healthcare workers [e.g. Professional Identity Scale for Healthcare Students and Professionals; (Liao & Wang, 2020)]. However, within chiropractic, while research has explored attitudes related to CPI, there is currently no tool available that specifically assesses CPI across its multiple domains. This represents a significant gap in the profession, as essential questions about chiropractors' professional identity and their expected behaviours remain unanswered. Developing an instrument to measure CPI could help chiropractors clarify their role and distinguish themselves from other related professions. Furthermore, it could shed light on areas where the profession could enhance and strengthen its professional identity, potentially leading to increased self-esteem, job satisfaction, and success (Barbour & Lammers, 2015; Hotho, 2008; Skorikov & Vondracek, 2011). Notably a strong professional identity is crucial, as a poor identity within chiropractic, has been linked to burnout and professional dissatisfaction (Williams, 2011).

The objective of this current research is to develop a concise psychometrically robust instrument capable of capturing the fundamental elements shared across all chiropractic practice approaches while operationalising the CPI construct. The significance of this study becomes evident in several key areas: Firstly, clinicians can significantly benefit from this tool as it empowers them to assess their own CPI, potentially leading to enhanced career satisfaction and personal growth. Secondly, patients also stand to gain from this research as the CPIES can be applied to explore correlations with patient health outcomes, providing insights into the effectiveness and significance of diverse aspects of chiropractic care. Additionally, the instrument can be employed to assess the development of professional identity over time, contributing to deeper understanding of the evolving nature of CPI. Lastly, chiropractic organisations and institutions can use the CPIES to evaluate their

collective or individual CPI, aligning their practices more closely with their values and objectives.

5.2 Method

This study employed an exploratory sequential mixed methods design, consisting of two crucial stages: a conceptual design and psychometric evaluation stage (Burton & Mazerolle, 2011; Zhou, 2019). The initial phase involved constructing a scale, followed by a qualitative component involving expert feedback. Expert key informants were consulted to identify and address any conceptual or practical issues in the instrument's development. This process resulted in a set of candidate items for the Chiropractic Professional Identity Embodiment Scale (CPIES). These items were then subjected to quantitative psychometric testing. The study obtained ethical approval (Auckland University of Technology Ethics Committee - approval 21/166) and informed consent from participants.

5.2.1 Item Generation

The primary author initiated the scale creation where the content and scope of candidate items were developed for a chiropractic context by reviewing professional identity literature across healthcare professions, such as, counselling, osteopathy, medical practice, and physiotherapy (Glucina et al., 2023a). Eighty three candidate items were formulated with individual items oriented to assess one of the six CPI domains (Chiropractic History- 10 items, Engagement and Interactions- 11 items, Ethics and Standard of Practice- 10 items, Philosophy and Motivations- 16 items, Pride and Attitude- 17 items and Roles and Expertise- 19 items) (Glucina et al., 2023a), avoiding repetition and item redundancy. Where possible, item statements were written in the present tense without the use of double negatives and indefinite qualifiers (e.g., merely, seldom), in less than 20 words. The items utilised a 5-point Likert scale format to assess knowledge, attitudes, behaviours, and beliefs related to CPI.

5.2.2 Expert Key Informants

The study recognised the importance of expert practitioners to understand the knowledge and competencies of domain-specific professional knowledge (Campbell, 2019). Whilst there is no agreed definition of an *expert* (Germain & Ruiz, 2009), special forms of *experience-based expertise* (Leonard-Barton & Swap, 2005), and knowledge, skills, and abilities, are generally accepted (Campbell, 2019). In addition to possessing the requisite profession-specific skills, individuals also bear a special responsibility to act correctly (Quast & Siedel, 2018). The criteria for selecting participants in this research focused on two categories to ensure that: (1) chiropractors had a solid academic background via additional academic qualifications, or by holding a lecturing or senior authoritative position within the chiropractic field, or (2) had extensive expertise in chiropractic practice by having at least seven years of practical experience.

Estimating the appropriate number of participants in qualitative research can be challenging, as sample sizes range from *n*=5 to 15, with adequate feedback often requiring multiple sessions (Beatty & Willis, 2007; Farnik & Pierzchała, 2012; Willis, 2005) depending on the context and topic. For this study, the sample of expert key informants was recruited through announcements by the primary researcher (a chiropractor) at the NZ Chiropractors Association (NZCA) Annual General Meeting (AGM) in July 2021, and through word of mouth. To ensure diversity in the sample, maximum variation sampling techniques were used (Etikan et al., 2016; Hulley, 2013) in consideration of factors such as clinical experiences, graduating institutions, practice styles, and general information known to the primary researcher from professional relationships, of NZ-based, Board-registered chiropractors.

The primary researcher initially identified potential candidates for the study who responded to a flyer presented at the NZCA AGM. A total of 19 candidates were approached, with 15 individuals interviewed by the primary researcher via one-to-one videoconferencing between September and December 2021. Interviews were recorded, and field notes were collected by the primary researcher. To ensure data saturation, and gather relevant information, expert feedback was obtained through three rounds of five interviews each. Participants from each round contributed to the development and refinement of a new draft scale, which was subsequently evaluated by the next round of experts. The three interview

rounds aimed to ensure diverse input, with an even distribution of seniority levels. In instances where contradictions or discrepancies arose between rounds, the primary researcher made final decisions.

To gain culturally specific insights into expert attitudes, experiences, and beliefs, this research utilised the qualitative cognitive interviewing process. Cognitive interviewing entails debriefing between the interviewer and the participant to ensure that the intended meaning of survey items aligns with the respondent's interpretation (Willis, 2005). Cognitive interviewing has gained popularity in scale development for assessing content validity, improving item clarity, and refining or proposing item revision changes to ensure appropriateness for the target population (Amtmann et al., 2018; Dietrich & Ehrlenspiel, 2010; Peterson et al., 2017; Wolcott & Lobczowski, 2021).

During the data collection process, participants used think-aloud procedures and verbal probes to describe their thought processes as they interpreted, paraphrased, and responded to survey items; this helped identify any misunderstandings or ambiguities in wording (Dietrich & Ehrlenspiel, 2010; Wolcott & Lobczowski, 2021). Participants also reviewed each item to confirm its placement in the correct domain. To mitigate order effects, two survey versions with reversed ordered items were created.

After receiving feedback from expert key informant interviews and reviewing field notes, think-aloud statements were analysed using coding schemes with notations and tables, following suggested methods (Peterson et al., 2017). This analysis helped identify candidate pool items that required amendments or deletions. Through iterative revisions and continuous feedback and assessment rounds, the CPIES was developed further until the final version was achieved (Irwin et al., 2009).

5.2.3. Psychometric evaluation of draft scale

5.2.3.1. Participants

The study, conducted in an online setting, used non-random probability sampling to recruit participants (Hulley, 2013), including chiropractic students and Board-registered chiropractors. Recruitment efforts involved announcements at the 2021 NZCA AGM, three

email invitations to chiropractors through the NZCA e-database (*n*=458), and two Facebook post invitations on the NZ College of Chiropractic (NZCC) alumni page, from March to June 2022. Student recruitment involved three email invitations via the Year 1-4 NZCC student database over this same 3-month period.

5.2.3.2. Procedure

Participants were asked to review the study's purpose and selection criteria, agree to participate, and complete an online web-based survey that was anticipated to take an average of 30 minutes.

5.2.3.3. Measure

The initial version of the survey included two sections: a demographic questionnaire and a set of candidate items for the CPIES (see Supplementary Material Table S1). Section 1 collected information on participants' background including gender, age, ethnicity, year of graduation, graduating institution location, highest qualification level, and chiropractic roles undertaken.

Section 2 included 92 survey candidate items grouped into six domains of CPI. Three questions related to self-identified categorisation of professional identity were also evaluated. To mitigate order effects, two survey versions of Section 2 with reversed ordered items were created.

5.2.3.4. Data analyses

The completed survey data underwent multi-stage statistical psychometric analysis using IBM SPSS (version 25). Exploratory factor analysis (EFA) was conducted to assess how well the items performed within the six conceptual subscales to explore the overall dimensionality of the scale. The EFA procedures were conducted iteratively and encompassed three key steps: (a) an assessment of the datasets suitability for factor analysis, (b) interpretation of item loadings on the extracted factors – (where a cautious approach was adopted for retention, with items being systematically removed if their factor

loadings fell below 0.40 in the early stages of the analyses and below 0.50 in the final analysis), and (c) identifying and defining the underlying factor structure. This comprehensive process allowed for the refinement and selection of the most robust items to constitute the final CPIES.

Principal Component Analysis was used to reduce the dimensionality of a dataset and obtain a simple structure while preserving and maximising the total variance of the loadings within the factors (Jolliffe & Cadima, 2016). The Kaiser criterion was applied to determine the number of factors, and the Promax method of rotation was employed as this oblique technique enables any factors to be correlated.

The analysis proceeded through an iterative fashion, incorporating both psychometric and conceptual criteria. Initially, a conceptually guided analysis strategy was employed to evaluate the strength of each item within its domain. This involved scrutinising the distribution of the data, discarding items with kurtosis and skewness outside the range of -2.50 to 2.50. Factor loadings and cross-loadings were evaluated to gauge the contribution of each item to the domains overall construct.

To mitigate the inclusion of potentially biased items, a rigorous criterion involved removing any items displaying a moderate or strong correlation (r>0.40) with the professional identity opinion (PIO) self-categorisation PIOQ1 survey item: “I am fundamentally a VS-focused chiropractor”. This item was selected for its mutually exclusive nature, enabling a clear assessment of item bias. Given that there were more participants aligned with the VS approach, PIOQ1 was chosen to explore to what extent items differentiate between those aligned with the VS approach and others. This step was crucial to prevent any bias given a reported NZ VS-focus (Glucina et al., 2021), and to avoid introducing problematic or potentially divisive items skewed towards a specific practice or subtype orientation. Additionally, items were assessed for the need of reverse coding to ensure a uniform direction prior to conducting EFA.

5.3 Results

The demographic characteristics of the participants involved in all stages of the research are presented in Table 5.1. For the expert key informant feedback, the average interview duration in this study was 57 min. After three rounds of feedback, 16 items were reworded (excluding grammar or similar edits), one item changed domains, two items were deleted, and 11 items were added to the initial pool of 83 items. The expert feedback supported 92 items of the CPIES as having content validity.

The average survey took 28 min to complete. Preliminary analysis revealed that 287 individuals clicked on the survey link. However, 22 participants withdrew early during the demographic questionnaire, and 34 discontinued partway through a domain of Section 2. A total of 231 cases were retained for data analysis, with a minimum requirement of completing one full domain. There were 198 fully completed surveys, while others completed varying numbers of domains, ranging from one to five of the six.

For the psychometric evaluation stage, the study achieved an overall response rate of 40% from the target sample with 287 individuals opening the link out of 725 recipients. Most participants were under 30 years of age, with 50% being female. Respondents had varying levels of professional experience ranging from chiropractic students to practitioners with over 50 years of experience. Most respondents (37%) were recent NZCC graduates, having graduated from 2010 onwards. Across the entire sample, 80% had either graduated from or were currently studying at the NZCC. An additional 11% had graduated from an Australian institution (Table 1).

In the survey, participants were asked to categorise themselves into subtypes by responding to three dichotomous yes-no questions regarding whether they identified as a VS, centrist or MSK chiropractor. Many participants endorsed multiple categories, which led to a recoding based on a philosophical continuum (Table 2). Among the research sample, the findings showed that 21% of participants exclusively identified with a VS-focus, 25% with a centrist-focus, and 6%, with an exclusive MSK-focused practice orientation. Interestingly, 73% of respondents indicated a degree of centrist orientation through their hybrid responses, suggesting a mix of philosophical perspectives among participants. There were no significant

differences in the proportions of student responses or across orientation categories ($\chi2(4)=8.42$, $p>0.05$).

Table 5.1

Demographic Characteristics of the Participants

Demographic category	Participant characteristics	*Expert key informants (n=15)*	*Chiropractor sample (n=175)*	*Student sample (n=56)*
Age range	Under 30	7%	21%	84%
	30 to 44	40%	37%	14%
	45 and above	53%	42%	2%
Gender	Male	47%	54%	34%
	Female	53%	45%	64%
	Gender Diverse	-	1%	2%
Ethnicity	European	53%	59%	57%
	British	13%	6%	7%
	Māori	13%	6%	11%
	Pasifika	7%	2%	2%
	Asian	7%	7%	11%
	American		2%	2%
	Other	-	11%	6%
	Other: Australian	7%	5%	2%
	Other: Canadian	-	2%	2%
Graduating institution location	New Zealand	33%	73%	100%
	Australia	33%	15%	-
	United States of America	13%	6%	-
	Canada	-	2%	-
	Europe/ United Kingdom	7%	4%	-
	Asia	7%	-	-
	Africa	7%	-	-
Year of graduation by decade	*2022-2025	-	-	100%
	#2020-2021	-	13%	
	2010-2019	20%	36%	
	2000-2009	47%	25%	
	1990-1999	13%	14%	
	1980-1989	13%	10%	
	1970-1979	7%	2%	
	1960-1969	-	<1%	
Highest qualification	Bachelor’s degree	27%	57%	25%
	Post-graduate certificate or	53%	19%	12%

	post-graduate diploma			
	Honours or Master's degree	7%	14%	4%
	PhD	-	1%	-
	Other	13%	9%	59%
Chiropractic roles	Full time practice	40%	54%	-
	Part-time practice	7%	11%	-
	Practicing and profession leadership/ consultant or management	13%	15%	-
	Practising and university/college lecturing and related	13%	10%	-
	University/college lecturing and related	20%	4%	-
	Other	7%	6%	-
	Year 1 NZCC student	-	-	27%
	Year 2 NZCC student	-	-	9%
	Year 3 NZCC student	-	-	23%
	Year 4 NZCC student	-	-	41%

* = Not yet graduated at time of study
# = New graduates
- = No response recorded
NZCC = New Zealand College of Chiropractic

5.3.1 Domain-level Analyses

The dataset's adequacy for factor analysis was confirmed by a Kaiser-Meyer-Olkin coefficient of 0.72 and a significant Bartlett's Test of Sphericity ($\chi^2(231) = 559.58$, $p < 0.001$). In the various domains of the survey, candidate items were subjected to screening and analysis to determine their suitability for inclusion in the final measurement tool. The *Philosophy and Motivations* domain of the survey initially contained 23 candidate items, assessing aspects

related to participants philosophical beliefs and motivations as a chiropractor (see Supplementary Material Table S1). For example, item 1 asked the respondent to rate their

Table 5.2

Categorisation of Chiropractors' Professional Identity Along a Philosophical Continuum

Original item response through dichotomous rating			Subsequent philosophical continuum recode	Respondent identification (%)
PIOQ1	PIOQ2	PIOQ3		
Y	N	N	1	21
Y	N	Y	2	40.3
N	N	Y	3	25.3
N	Y	Y	4	7.5
N	Y	N	5	5.9

PIOQ1 = I am fundamentally a Vertebral Subluxation (VS) focused chiropractor
PIOQ2 = I am fundamentally a Musculoskeletal (MSK) focused chiropractor
PIOQ3 = I am fundamentally a centrist (shared aspects of VS and MSK treatment focused chiropractic) chiropractor
Y= Yes
N=No

belief on "I consider myself a Doctor of Chiropractic Medicine/ Chiropractic Physician". However, after psychometric screening and analysis, several items were removed from this domain, due to elevated kurtosis or skewness (items 7, 8, 13, and 14), and potential bias by correlating them with PIOQ1 (items 2-4, 9 and 20). Reverse coding was applied to items 1, 10, 12, 15, 16 and 21. Initially, EFA suggested a five-factor solution based on the Kaiser criterion, but this found uninterpretable due to multiple cross-loadings. Further explorations with four, three, and two factors also revealed issues. Finally, a one-factor solution was forced for this domain. During this process, items 1, 12, and 17 were deleted because their factor loadings were below the 0.40 threshold. Two more rounds of EFA resulted in the removal of items 6, 19, and 22. Items with loadings >0.50 were retained. This led to a final set of seven items (5, 10, 15, 16, 18, 21 and 23) representing the Philosophy and Motivations

subscale (Table 3). This solution explained 37.41% of the variance, with acceptable internal consistency demonstrated (α = 0.72, ω = 0.71).

Table 5.3

The CPIES Items with Means, Standard Deviations, and Final Re-calculated Factor Loadings for Individual Domain-Level Analyses

Domain	Item number	Item Statement	Factor loading	*M*	*SD*
Chiropractic History	4	Chiropractors need to understand the traditional chiropractic theory that adjusting the spine corrects 'dis-ease'	0.85	2.23	1.24
	2	Chiropractic history and the philosophy of chiropractic is what sets it apart from other professions	0.83	2.03	1.19
	7r	Contemporary evolving scientific evidence is more important than traditional chiropractic principles	0.64	3.00	1.26
	3	I can clearly explain DD Palmer's core chiropractic principles (e.g., universal and innate intelligence etc.)	0.76	1.86	1.11
Engagement & Interactions	10	I am engaged in discussions with other chiropractors about the identity and vision for our profession	0.70	3.94	1.02
	6	I actively engage in current research (e.g., being involved in a study, undertaking research)	0.65	3.11	1.26
	12	To foster professional development, I actively mentor others (e.g. students, graduates, experienced practitioners)	0.63	3.78	1.26
	5	I educate the community and public about my profession	0.63	4.32	0.83
	9	I seek feedback/consultation from chiropractic peers as a form of professional development	0.61	4.11	0.99
	8	On behalf of my profession, I advocate for chiropractic by participating in activities associated with legislation, law, and policy	0.60	2.97	1.40
	7	I keep up with scientific, theoretical and technique advancements in my	0.56	3.99	0.95

		profession (e.g., journals, books, seminars)			
Ethics & Standards of Practice	1r	Patients with severe spinal issues (e.g., spinal canal stenosis) should not receive chiropractic care and instead need to be referred to an orthopaedic surgeon or specialist	0.74	3.87	1.18
	3r	It is important to maintain a mechanistic medical model perspective when conceptualising a patient's presenting concern	0.69	3.30	1.30
	7	Chiropractic care is beneficial for the patient irrespective of symptom change/improvement	0.67	4.12	1.11
Pride & Attitude	6	I recommend my profession to those who are searching for a new career	0.79	4.28	1.04
	7r	I believe the chiropractic profession is not as credible as other health professions (e.g., physiotherapists, osteopaths) with similar levels of training	0.76	4.11	1.31
	1	Chiropractic is predominately a wellness-based approach to health and wellbeing	0.67	4.15	1.13
	9r	Chiropractic education should be gained as post-graduate certification rather than through a full degree programme	0.62	4.21	1.16
Philosophy & Motivations	10r	Patients should set their care plan based on their symptoms	0.66	3.84	1.13
	5	The vertebral subluxation is the underlying cause of most health problems and clinical presentations	0.65	2.96	1.15
	23	Generally, I believe the body can heal itself without medicines (e.g. use of vaccinations, antibiotics for a respiratory infection)	0.62	4.14	1.15
	18	I term people that receive chiropractic as 'practice members' or 'clients' (or similar) instead of 'patients'	0.61	3.52	1.44
	15r	Chiropractic researchers should focus on physiological mechanisms of spinal manipulative therapy	0.61	3.00	1.21
	16r	Chiropractic researchers should focus on outcomes/cost-effectiveness of integrative care models	0.57	2.53	1.04

	21r	I call the application of chiropractic care an adjustment, even though I do not assess for vertebral subluxation	0.57	3.55	1.24
Roles & Expertise	20r	The inclusion of clinical chiropractic training internships in integrative medical settings is essential to progress the profession	0.79	3.02	1.20
	11r	Multidisciplinary collaborative practice is the way forward for the chiropractic profession	0.77	3.53	1.15
	16r	It is vital to make a differential diagnosis(es) or clinical impression(s) when seeing a patient	0.69	3.69	1.22
	21r	Extremity work is an integral part of chiropractic practice	0.66	3.83	1.18
	19r	The public health care setting (hospitals and local emergency health centres etc.) are appropriate settings for chiropractic health care	0.58	3.44	1.32
	6r	I aim to treat a patient's symptoms, improve wellbeing, and give choices about health	0.51	4.25	0.99

CPIES = Chiropractic Professional Identity Embodiment Scale
M = Mean
SD = Standard Deviation
r = Indicates reverse coded item

The *Roles and Expertise* domain initially comprised of 21 items. Items 3, 7, 9, and 15 were removed due to statistical issues (elevated kurtosis and skewness). Bias assessment led to the removal of items 1, 2, 5, 8, 14, and 17. After applying reverse coding, items 12 and 13 were removed due to the reduced reliability of the subscale if they were included. Despite initially yielding an uninterpretable two-factor solution, a forced one-factor solution resulted in a final set of six items (6, 11, 16, 19-21) explaining 45.28% of the variance, with acceptable reliability being demonstrated ($\alpha = 0.75$, $\omega = 0.75$).

The *Pride and Attitude* domain initially consisting of 17 items, underwent screening that resulted in the removal of items 5, 8, 10, 11, and 12 due to statistical issues. Items 4 and 13 were removed due to bias. After reverse coding, an uninterpretable three-factor solution emerged from an EFA, which was ultimately forced into a single-factor solution. After three rounds of EFA, items and 2,3, 14-17 were deleted based on factor loading criteria. The final

four item single-factor solution explained 50.46% of the variance. However, the subscale demonstrated questionable reliability (α = 0.67, ω = 0.68).

The *Engagement and Interactions* domain initially comprised of 12 items. However, after screening and refinement, item 11 was deleted due to statistical issues. Item 1 was considered biased, and item 2 reduced the reliability, leading to their deletion. An EFA initially yielded an uninterpretable two-factor solution, which was then forced into a one-factor solution where all items were retained. This seven-item subscale explained 39.40% of the variance and demonstrated acceptable internal consistency (α = 0.73, ω = 0.73).

In the *Chiropractic History* domain, preliminary screening of the original 11 items led to the removal of items 8 and 10 due to statistical issues. Items 5, 6 and 11 were removed due to bias, and item 9 was removed as it was considered to be unfamiliar for a student population. After applying reverse coding (items 1 to 4), an EFA initially yielded an uninterpretable two-factor solution, which was then forced into a one-factor solution, where all remaining items were retained. This four-item subscale that explained 59.85% of the variance, and demonstrated acceptable reliability (α = 0.77, ω = 0.78).

The *Ethics and Standards of Practice* domain originally comprised eight items which underwent screening. Due to statistical issues items 2, 4 and 5, and due to bias items 6 and 8, were removed. The EFA resulted in a single-factor solution where all remaining items were retained. The final three item subscale explained 48.89% of the variance but exhibited unacceptable reliability (α = 0.48, ω = 0.48).

5.3.2 Testing Suitability of a Unidimensional Scale

To address the varying reliability findings of the subscales, further EFA was conducted on the final set of 31 items across the six subscales. This analysis aimed to assess whether the overall reliability could be improved by having a unidimensional scale, *also* facilitating the creation of a simplified instrument for a quick brief assessment of CPI. Initially, a nine-factor solution emerged. However, this and the subsequent forced factor solutions that followed, yielded complex cross-loading patterns, and were deemed uninterpretable. Consequently, a single-factor solution was forced, and items with factor loadings <0.40 were systematically removed from the following subscales: Roles and Expertise (items 6r and 19r), Pride and

Attitude (item 9r), Engagement and Interactions (items 5-10 and 12). In a subsequent EFA of the remaining 21 items, a criterion of <0.50 factor loading was applied to further reduce the scale's length, aligning with the goal of conciseness. This step led to the removal of items from the Philosophy and Motivations (15r, 16r, 21r), Pride and Attitude (item 7r), Roles and Expertise (item 21r), and Ethics and Standards of Practice (item 1r) subscales. The final 15-item unidimensional CPIES (Table 4), emerged from this process, explaining 35.51% of the variance and demonstrated strong reliability (α = 0.87, ω = 0.86).

Table 5.4

The Final Refined CPIES Items with Factor Loadings in a Unidimensional Model

Original domain Item number	Item #	Item Statement	Factor loading
Hist4	1	Chiropractors need to understand the traditional chiropractic theory that adjusting the spine corrects 'dis-ease'	0.70
Ethics3r	2r	It is important to maintain a mechanistic medical model perspective when conceptualising a patient's presenting concern	0.49
Pride6	3	I recommend my profession to those who are searching for a new career	0.59
Phil10r	4r	Patients should set their care plan based on their symptoms	0.54
Roles20r	5r	The inclusion of clinical chiropractic training internships in integrative medical settings is essential to progress the profession	0.54
Hist2	6	Chiropractic history and the philosophy of chiropractic is what sets it apart from other professions	0.68
Ethics7	7	Chiropractic care is beneficial for the patient irrespective of symptom change/improvement	0.62
Pride1	8	Chiropractic is predominately a wellness-based approach to health and wellbeing	0.60
Phil5	9	The vertebral subluxation is the underlying cause of most health problems and clinical presentations	0.62
Roles11r	10r	Multidisciplinary collaborative practice is the way forward for the chiropractic profession	0.56
Hist7r	11r	Contemporary evolving scientific evidence is more important than traditional chiropractic principles	0.64

Phil23	12	Generally, I believe the body can heal itself without medicines (e.g. use of vaccinations, antibiotics for a respiratory infection)	0.68
Roles16r	13r	It is vital to make a differential diagnosis(es) or clinical impression(s) when seeing a patient	0.50
Hist3	14	I can clearly explain DD Palmer's core chiropractic principles (e.g., universal and innate intelligence etc.)	0.61
Phil18	15	I term people that receive chiropractic as 'practice members' or 'clients' (or similar) instead of 'patients'	0.55

CPIES = Chiropractic Professional Identity Embodiment Scale
r = indicates reverse coded item
Hist= Chiropractic history
Phil = Philosophy and motivations
Roles = Roles and expertise
Pride = Pride and attitude
Ethics = Ethics and standards of practice

5.3.3 Domain Level, Unidimensional Scale, and Philosophy Continuum Correlations

Further domain analyses were conducted where correlations, and potential relationships with the CPIES and philosophical continuum sum scores were examined (Table 5.5). Notably, the strongest correlation emerged between the Philosophy and Motivations and Chiropractic History subscale scores (r=0.60). There were no significant correlations observed between the Engagement and Interaction subscale and any of the other subscales or total CPIES sum score. The remaining five subscales had strong correlation coefficients (r>0.50) with the CPIES sum score. The highest correlation with the CPIES was observed for the Chiropractic History subscale (r=0.82). For the philosophical continuum score, the highest correlations were found with the Philosophy and Motivations subscale score and CPIES sum score (r=-0.70), and the lowest was observed with the Engagement and Interaction subscale (r=-0.17).

5.4 Discussion

The purpose of this study was to develop and validate a scale for assessing the professional identity of chiropractors. The development of the CPIES process involved multiple stages, including a conceptual phase guided by theoretical domains (Glucina et al., 2023a), expert feedback, and psychometric evaluation, using a sample of chiropractors and chiropractic students, to identify suitable items and factor structure.

Table 5.5

Correlation Matrix (Spearman's rho) Between CPI Domains and CPIES Sum Scores and Philosophical Continuum.

	Engagement & Interactions	Ethics & Standards of Practice	Philosophy & Motivations	Pride & Attitude	Roles & Expertise	CPIES	Philosophical Continuum
Chiropractic History	0.12	0.45**	0.60**	0.42**	0.43**	0.82*	-0.58**
Engagement & Interactions		0.10	0.08	0.05	-0.02	0.12	-0.17*
Ethics & Standards of Practice			0.57**	0.41**	0.44**	0.70**	-0.52**
Philosophy & Motivations				0.38**	0.51**	0.81**	-0.70**
Pride & Attitude					0.27**	0.56**	-0.36**
Roles & Expertise						0.66**	-0.50**
CPIES							-0.70**

CPI = Chiropractic Professional Identity
CPIES = Chiropractic Professional Identity Embodiment Scale
** $p = 0.01$
*$p = 0.05$

To enhance content validity, which assesses how well an instrument reflects the construct being measured (Mokkink et al., 2010), a comprehensive review process was implemented, with 15 expert key informants critically evaluating and approving candidate items (McDowell, 2006). This rigorous feedback process ensured that the instrument remained contextually relevant within the chiropractic field.

The initial pool of 92 candidate items underwent psychometric testing using conceptually guided EFA, leading to a reduction in items to 31 across six subscales. These included the four item Chiropractic History, 7-item Engagement and Interactions, 3-item Ethics and Standard of Practice, four item Pride and Attitude, seven item Philosophy and Motivations, and six item Roles and Expertise subscales. The reliability of the domain subscales varied, with particular concern for the Ethics and Standards of Practice subscale. However, the survey's length can impact reliability, and a lower number of items, which was the case for this subscale (originally containing the fewest candidate items, *n*=8), may lead to a lower alpha value and thus reduced reliability (DeVellis, 2017; Tavakol & Dennick, 2011). Overall, most subscales showed sufficient reliability with five of the subscales having a value of >0.60 (Syah et al., 2021).

Due to the variable subscale reliability, the 31-items across the six subscales were analysed as a unidimensional model, resulting in a single-factor 15-item CPIES, that demonstrated good reliability and internal consistency. Interestingly, none of the items from the Engagement and Interactions subscale demonstrated adequate factor loadings and were thus not included in the final scale. Although this subscale may hold conceptual relevance, the absence of strong empirical support raises questions regarding its practical and clinical relevance in measuring CPI, suggesting that it may have to be measured differently or separately to ensure its accurate representation. Users of the scale are thus able to use the six subscales on their own, of course noting the fact that the Ethics and Standards of Practice subscale has low reliability. These subscales may serve useful as discussion tools, particularly in the training of new chiropractors. However, when brief and reliable measurement of CPI is required, we recommend the 15-item unidimensional CPIES.

The Chiropractic History subscale exhibited the strongest correlation with the CPIES, prompting inquiry into the importance of understanding chiropractic history in the development of a strong CPI. Additionally, the study revealed an intriguing finding where

chiropractors with a stronger MSK-orientation had lower CPIES scores, while those with a more VS-orientation displayed higher scores (Table 5). This may suggest a potential relationship between philosophical orientation and CPI, which may be influenced by dynamics of in-group vs out-group perceptions. This connection prompts further exploration into the underlying reasons for different CPI scores between chiropractic subtypes.

One possible explanation may be related to differences between in in-group and out-group perceptions between VS and MSK practice orientations attributed to intergroup behaviour dynamics. This phenomenon involves a complex interplay of socio-psychological norms that encompass social behaviours, attitudes, equity, cooperation, and conformity (Brewer, 2010). Group categorisation often leads to intergroup threats, when one group's beliefs, actions, or characteristics challenge another's, reinforcing in-group solidarity and deepening the divide (Hogg, 2016). In response to such threats, individuals employ self-affirmed adaptive defensive responses to protect their groups integrity (Riek et al., 2006; Sherman & Cohen, 2006). This can occur even when individual self-interest is not directly affected, as collective interests can foster in-group unity (Sherman & Cohen, 2006).

In this context, VS-oriented chiropractors may perceive themselves as the out-group due to opposition to its philosophy (Villanueva-Russell, 2011), resulting in stronger protection of their group's position and ideology. Notably, there is an academic narrative emphasising that the chiropractic profession should base its future on evidence-based science rather than perceived ideological dogma of the VS approach (Leboeuf-Yde et al., 2019; Reggars, 2011; Swain et al., 2021). This view may trigger protective behaviour among VS-oriented chiropractors in response to perceived misjudgements and unjust criticisms of their group, as it aligns with Self-Affirmation Theory, which underscores the motivation of individuals to defend their social identities at both the individual and collective levels (Hogg, 2016; Sherman & Cohen, 2006). Given the complexities of intergroup behaviour and its potential impact on professional identity within the chiropractic profession, it becomes imperative to explore strategies that can mitigate biases and promote unity.

These strategies may include reducing biases by reshaping boundaries through re-categorisation (Brewer, 2010; Gaertner et al., 2010). Re-categorising practice orientations along a continuum to focus on commonalities may foster inclusivity (Dovidio et al., 2007), and an approach such as the recoding along a continuum used in this research, may

contribute to this process. Additionally, fostering positive intergroup contact through events, symposia, and conferences that include representation from all practice orientations, can help alleviate intergroup anxiety and threat (Árnadóttir et al., 2018; Turner et al., 2007). Such approaches have the potential to reduce intergroup tensions and promote a stronger sense of cohesion within the chiropractic profession.

This study challenges some previous research findings by revealing higher levels of solidarity in practice approaches (de Luca et al., 2018; Gíslason et al., 2019; Gliedt et al., 2015; Puhl et al., 2014; Swain et al., 2021; Wouters et al., 2022). Whilst our study aligns with research showing approximately 20% of chiropractors adopt an exclusive VS-focussed approach (Glucina et al., 2020; Smith & Carber, 2008), our study also shows that 86% of chiropractors consider the VS approach in their practice. This figure is notably higher than the upwards of 70% reported in a recent study (Glucina et al., 2020).

A novel finding in our research is the quantification of the centrist'-orientation, with 73% of chiropractors exhibiting elements of this subtype. This statistic was unreported in previous chiropractic literature (Glucina et al., 2020; Good, 2010), which had primarily concentrated on mutually exclusive and polarised practice orientations (Gíslason et al., 2019; Gliedt et al., 2021; McGregor et al., 2014). The simplicity of the self-categorisations used in our study suggests that practice subtypes may not be as distinct as previously assumed, indicating potential overlaps in practice approaches. This insight sheds new light on the diversity of chiropractic practice orientations and calls for a more nuanced understanding of the profession's landscape.

5.4.1 Limitations

This study has several limitations. First, the CPIES instrument has not been assessed for test-retest reliability, nor discriminant validity given the absence of comparable chiropractic surveys. Future research could compare the CPIES with established professional identity measures in health-related fields.

Even though the sample size appeared to have reached the minimum requirement for factor analysis, a larger sample size would nevertheless result in more robust results (Siegert et al.,

2022). Given some relatively small populations, a large sample may be difficult to achieve in some countries. However, larger datasets from several countries may enable confirmation of the psychometric properties of the CPIES in addition to establishment of cross-cultural validity through approaches like multi-group invariance testing (Fischer & Karl, 2019) or Rasch analysis (Medvedev & Krägeloh, 2022).

The research sample may exhibit bias as it consisted of NZCC alumni. Efforts were made to maximise the response rate through diverse invitation sources and acknowledging this potential bias. Moreover, the disproportionate representation of NZCC graduates among respondents (80%) exceeds the proportion of NZCC graduates among registered chiropractors in NZ (69.5%) (New Zealand Chiropractic Board, 2021), potentially contributing to a greater presence of VS-oriented participants compared to international surveys (Gíslason et al., 2019; Gliedt et al., 2021; McGregor et al., 2014). Additionally, the sample exhibited an underrepresentation of Pacific people and individuals of Asian and Māori descent in comparison to national demographics (Stats NZ., 2019), although it was still higher than the corresponding figures reported within the chiropractic profession (Glucina, 2023).

5.4.2 Implications and Future Directions

The study holds significant implications for chiropractors, educators, and the profession particularly in establishing or enhancing training standards. The findings offer practical guidelines for professionals and educators to assess and strengthen their own CPI. Recognising the imperative for aligning student recruitment with institutional directives/approaches (Innes et al., 2022), the CPIES holds potential value in both student recruitment and institutional hiring practices to ensure the best fit for staffing positions. Future research could also explore the evolving nature of professional identity through the course and experiences of one's career, and the influence of CPI on interprofessional collaboration, therapeutic alliance, patient satisfaction and health outcomes.

Using a consistent instrument to measure CPI may impact the profession by advancing collective identity, promoting legislative efforts to highlight points of difference between chiropractic and related health practices, and assisting in continuing professional

development activities for members to target role development and responsibilities (Biehl et al., 2021; King & Stretch, 2013). The CPIES scale may aid the World Federation of Chiropractic achieve its mission of establishing a clear professional identity (World Federation of Chiropractic, 2012), boosting practitioner success and satisfaction (Molleman & Rink, 2015; Owens & Godfrey, 2022). Utilising the CPIES allows the profession to shift its focus from individual practice orientations to recognising commonalities. Embracing diversity, in line with broader societal contexts encompassing social, political, and cultural beliefs and practices, serves as a catalyst for promoting unity within the chiropractic community.

5.5. Conclusion

The goal of this research was to develop a scale tailored for chiropractic practitioners and students, as the end users, utilising a top-down approach. The process involved expert key informant consultation and a conceptual framework to create scale candidate items for the CPIES. A methodology was then employed to identify the most suitable items to comprise a valid and reliable measure, ensuring robust validity and reliability. The successful operationalisation of the CPI construct using its six component subscales, or as a single 15-item instrument representing five subscales, may reflect the rich variation in the beliefs that chiropractors hold about their work and their profession.

Future research may explore professional identity development over time and assess the impact of CPI on interprofessional collaboration, therapeutic alliance, patient satisfaction, and health outcomes. Utilising the CPIES survey could inform targeted interventions to enhance professional development, improve self-esteem, and boost career satisfaction while reducing burnout. This has the potential to benefit chiropractors, patients, and the broader healthcare community.

Chapter 6: Test-Retest Reliability of the Chiropractic Professional Identity Embodiment Scale (CPIES)

Prelude

The estimation of reliability in research is very important. If findings from research can be replicated consistently, they are reliable. To achieve the goal of robust questionnaire development research, there is often the issue as to whether a repeated measure of the construct of interest would obtain the same result. A challenge in instrument-based research is having measures that are sensitive to changes of interest but are also stable over practical/appropriate time intervals.

Most times, obtaining the same results may not be feasible as participants and situations vary. However, all else equal, if a strong positive correlation exists between the results of the same test, reliability is indicated. This chapter focusses on further extending the psychometric validation of the Chiropractic Professional Identity Embodiment Scale (CPIES) by exploring its test-retest reliability.

6.1 Introduction

Professional identity encompasses the shared attitudes, values, knowledge, beliefs, and skills that are inherent within a specific professional community (Matthews et al., 2019). It is a multidimensional construct that can change and evolve over time (Walder et al., 2022). The development of professional identity entails the acquisition of knowledge, skills, and understanding of the realities and requirements, the ethical and moral principles, and personal and professional values of a profession (Kahlke et al., 2020; Sawatsky et al., 2020). It has been shown in occupational therapists that a lack of professional identity clarity can significantly undermine a practitioner's confidence in advocating for their professional opinions, leading to their belief that they are undervalued (Turner & Knight, 2015). Although

limited research exists specifically addressing whether this applies to chiropractors, studies suggest that many chiropractors struggle with confidence when conveying chiropractic concepts (Glucina et al., 2019). When chiropractors can effectively communicate these concepts, they report greater success in applying chiropractic interventions (Langlois et al., 2004), which may, in turn, influence patient outcomes.

In Chapter 5 of this thesis, a mixed-methods sequential exploratory study was used to address the lack of a profession-specific measurement instrument to assess professional identity among chiropractors (Glucina et al., 2024). Expert key informants provided feedback on candidate items which once finalised, were administered to participants through an online survey. To evaluate the suitability of the candidate items, conceptually guided exploratory factor analysis (EFA), were employed (Glucina et al., 2024). Psychometric analysis revealed that CPI could be reliably measured through six subscales or through one 15-item unidimensional scale named the Chiropractic Professional Identity Embodiment Scale (CPIES).

Reliability ”refers to the consistency between an instrument and the measures it produces” (Krabbe, 2016, , p.135). Given the favourable internal consistency demonstrated by the unidimensional scale, the evaluation of test-retest reliability becomes a pertinent step in enhancing the psychometric strength of the CPIES, which constitutes the central focus of this chapter. Test-retest reliability measures the consistency of an instrument's scores over two different occasions, assuming that all relevant conditions remain unchanged in the construct between the assessments (Krabbe, 2016).

Test-retest studies assist in understanding how dependable measurement tools are likely to be when employed in broader contexts such as research and clinical practice (Aldridge et al., 2017). Delving into test-retest reliability not only contributes to bolstering the instrument's psychometric properties but also affords a deeper insight into the nature of the CPI construct. This exploration seeks to determine whether the aspect of CPI, as gauged by this instrument, embodies a *trait*-like stability or whether it tends to fluctuate in response to contextual factors (e.g., a chiropractor’s identity may change at different times of the year due to seasonal differences in practice volume), resembling a more variable *state*.

6.1.2 State-Trait Theory

Latent state-trait theory (LST) is a psychological framework that applies whenever one investigates the consistency, variability and change of behaviour over time (Steyer et al., 2015). A trait (e.g., identity) is a relatively enduring and stable individual characteristic that is relatively consistent across different situations and over time. Conversely, a state (e.g., mood) is more transient and can vary situationally or over time. The LST model proposes that psychological variables fluctuate based on individual characteristics (e.g., traits) specifically in response to certain life events or interventions (Steyer et al., 2015). For example, psychological traits such levels of well-being change over time (Joshanloo, 2023; Luhmann & Intelisano, 2018).

Several factors can be used to assess state-trait stability. According to Joshanloo (2023), the variability of a observed variable measured at any given moment is influenced by three factors: a trait factor (which represents enduring characteristics of an individual), a time-specific state residual factor (which captures temporary or situational influences), and random measurement error (which represents the inherent imprecision in the measurement process). Research suggests that items function differentially over time (Joshanloo, 2022), hence it is important to assess item stability and change (Joshanloo, 2023).

The connection between professional identities and personal identities is not fixed or rigid; rather it is dynamic, multifaceted, and flexible (Masnan et al., 2021; Richardson & Watt, 2018). According to Ibarra (1999), professional identity is a stable and enduring construct that encompasses attributes, beliefs, motives, and experiences within one's professional role. It evolves over time and is influenced by various factors, with newer professionals exhibiting greater malleability in their professional identity. While professional identity may undergo changes over time, it typically aligns with the trait end of the state-trait continuum; displaying stability and endurance without rapid or transient fluctuations (Lane, 2018; Yu et al., 2021). Given this, it is logical to infer that CPI shares these characteristics. Consequently, one could explore how the CPI construct evolves during different career transitions, including the transition from undergraduate to postgraduate stages.

6.1.3 Reliability

Reliability is a crucial aspect of measurement in statistics and psychometrics, referring to the consistency of a measure over time and across different samples. Score consistency ultimately facilitates interpretations and increases the likelihood that the conclusions of an instrument are accurate (Bardhoshi & Erford, 2017). Highly reliable scores are accurate, reproducible, and consistent when repeated with a group of test-takers, where essentially the same results would be obtained (Kennedy, 2022). Professional identity measurement tools have a requirement to be psychometrically sound, with acceptable levels of validity and reliability (Matthews et al., 2019).

Every measurement procedure involves some degree of error, but it is the amount of error that determines the reliability of the measurement. Without adequate reliability, a measure's results may show inconsistency upon repeated use and might not be "relatively" free from measurement error (Matthews et al., 2019). Adequate reliability is required for adequate validity (Bialocerkowski & Bragge, 2008).

To assess reliability, the intraclass correlation coefficient (ICC) is the best method used to assess test-retest reliability with two or more raters (Krabbe, 2016). A high correlation coefficient indicates high reliability, as it means that the scores are consistent and repeatable. A reliability coefficient of 0.60 implies that 60% of the variance in the observed score can be attributed to the score itself whilst 40% is due to error (American Educational Research Association, American Psychological Association, 2014, National Council on Measurement in Education). The ICC is a measure of reliability that estimates the proportion of variability in the measurement that is due to true score differences among test-takers, as opposed to random error or measurement bias. The modern ICC is calculated using mean squares obtained through analysis of variance, providing a more precise estimate of reliability than the original Pearson's *r* correlation coefficient (Koo & Li, 2016).

The test-retest reliability coefficient is a valuable measure of the stability of test scores over time, obtained by administering the same test twice to the same group with a time interval in between, and correlating the two sets of scores (Pedisic et al., 2014). To use test-retest reliability, two assumptions must be considered. First, the testing effect suggests that the characteristic being measured remains unchanged over the given time period. Second,

memory effects suggests that the time interval for retesting should be long enough to prevent the influence of participants' memories from their first test-taking experience, yet short enough to allow for subsequent test administrations (Engel & Schutt, 2013).

Evaluating test-rest reliability is a common aspect of questionnaire design that gives some information about stability of the instrument (Aldridge et al., 2017). If the test-retest reliability of a measure is stable, it is likely that the construct is a trait with little measurement error present, whereas an unstable measure is suggestive of state changes or measurement error. Unless there are common variables that affected all participants (e.g., events shared by all such as semester holidays, or exam periods), the assumption made is that the overall state effect is averaged out to 0 across participants (Aldridge et al., 2017; Chen et al., 2017; Lee et al., 2021; Medvedev et al., 2022). This research aims to establish document the test-retest reliability of the CPIES, providing a foundation for its use in assessing changes in the CPI construct.

6.2 Method

6.2.1 Participants

As CPI has been partially assessed previously within a student population (de Luca et al., 2018), a student group from the New Zealand College of Chiropractic (NZCC) was employed, spanning four-year levels, to assess the test-retest reliability of the CPIES. The student groups varied in size across year levels, with 57 students in the 3rd-year level and 74 in the 1st-year level (Table 6.1).

6.2.2 Procedure

Convenience sampling was used to recruit participants over a 6-week period in March 2023, with a minimum sample size of 20 deemed suitable based on previous research (Dutil et al., 2017). The study was introduced to each year group by the primary researcher at the beginning of one lecture before both the first test occasion (Time 1, T1) and the second one (Time 2, T2) 4 weeks later. The CPIES survey was thus administered to the same student groups twice. Each survey was available for completion for a duration of 2 weeks. To access

the survey, participants were provided with a QR code, and the survey link was also uploaded onto each year level's Microsoft Teams channel. Before participating, students were given information about the study's purpose and selection criteria. They were assured of the survey's anonymity and informed that it would take approximately 10 min to complete. Participants were also informed of their right to withdraw from the study at any point. The survey was to be completed in their own time. It should be noted that the exact number of students present in each class during the researcher's introduction or the number of students who viewed the Teams chat advertising the study is unknown.

Table 6.1

Sample Sizes by Year Level and Time Point

	Total student body number (*n*)	Time 1 (*n*)	Time 2 (*n*)
Year 1	74	14	6
Year 2	69	20	12
Year 3	57	16	2
Year 4	78	16	3
Total	278	66	23

To facilitate participant selection in T1 and T2, specific matching criteria was established that necessitated three sociodemographic responses to be identical and distinct from those of any other participant. This additional step was essential due to the inherent challenges posed by the anonymised nature of data collection, which made it challenging to confirm whether a given participant had indeed undertaken the test at both time points.

6.2.3 Measures

Participants completed an online web-based survey to indicate their responses towards 15 CPIES statements on a 5-point Likert scale (Chapter 5 and Table 5.3). Participants also reported their age, gender, ethnicity, and level of education. Age was collapsed into 5-year

age groups, and ethnic groupings followed those outlined by Statistics New Zealand (Stats NZ - Tatauranga Aotearoa, 2019).

6.2.4 Data Analyses

The socio-demographic profiles were analysed using descriptive statistics in IBM SPSS v.29. To assess test-retest reliability of the CPIES, the intraclass coefficient (ICC) was employed. Following the recommendation by Shrout and Fleiss (1979), a two-way mixed-effects model, absolute agreement, single rater measurement was utilised for the intra-rater reliability test, considering that there were multiple scores from the same rater and generalising those scores to a larger population would not be appropriate.

The cut-off criteria used for the ICC was in accordance with that recommended by Koo and Li (2015), where ICC values less than 0.5 are indicative of poor reliability, 0.5 to 0.75 indicate moderate reliability, 0.75 to 0.9 indicate good reliability, and values greater than 0.90 indicate excellent reliability (Portney & Watkins 2009). Alternatively other criteria can be used such as that from Landis and Koch (1977) where 0.41-0.60 is considered moderate, 0.61-0.80 is considered substantial and 0.81-1.00 is considered almost perfect.

6.3 Results

Due to the anonymous nature of the survey and the lack of information on the exact number of students present in the lectures or engaged with the Teams posts, it is not possible to calculate the response rate for this study accurately. However, based on the minimum sampling frame, the response rate can be estimated to be 24%.

For participant selection in T1 and T2, the matching criteria required three sociodemographic responses to be the same and not comparable to another participant. Out of the participants who completed the surveys, a final sample of 23 participants met this criterion, representing a response rate of 35% among those who had completed the survey. An additional analysis conducted on the full sample revealed that the mean scores exhibited no significant changes, providing further substantiation of the CPIES' very strong reliability.

Table 6.2 shows the sociodemographic profiles of the participants, indicating their variations. The typical respondent in this sample was between 20-24 years old, enrolled in Year 2, female, European, and a chiropractic student who held a Diploma in Applied Science. The median time taken to complete the CPIES survey was 5 min for T1 and 4 min for T2.

Table 6.2

Demographic Characteristics of the Participants

Demographic category	Participant characteristics	*Percentage*
Age range	Less than 20	13%
	20-24	52.2%
	25-29	13%
	30-34	4.3%
	35-39	13%
	40-44	4.3%
Gender	Male	34.8%
	Female	65.2%
Ethnicity	European	30.4%
	Māori	13%
	Asian	13%
	MELAA*	13%
	Pasifika	8.7%
	Other: American	8.7%
	Other: Canadian	8.7%
	Other	4.3%
Highest Qualification	Completed high school	17.4%
	Diploma	47.8%
	Another undergraduate degree	21.7%
	Post-graduate Certificate or Post-graduate Diploma	13%

*MELAA= Middle Eastern or Latin American or African

For the agreement between T1 and T2 responses for a single measure (Table 6.3), the test-retest reliability was *good* to *excellent* taking the confidence interval values into account (ICC= 0.92 [95% CI 0.81 - 0.97]). This is interpreted as 92% true score variance and 8% error variance, in this case due to instability over time either because of testing circumstances or changes in the condition of the respondents at T1 or T2.

The ICC over two time points revealed that item 8 exhibited an excellent reliability (ICC=0.92, [95% CI 0.82 - 0.97]), while items 5 (ICC=.38 [95% CI -0.06 – 0.69), 10 (ICC=.49 [95% CI 0.09 – 0.75), and 12 (ICC=0.48 [95% CI 0.10 – 0.74), had poor reliability. The majority of items demonstrated moderate reliability across the two time points, and the CPIES sum score also exhibited excellent reliability further establishing the scales stability and reliability.

Table 6.3

CPIES Item Intra Class Coefficient (ICC) Between T1 and T2

Item	ICC	ICC interpretation
1	0.59	moderate
2	0.51	moderate
3	0.76	good
4	0.51	moderate
5	0.38	poor reliability
6	0.74	moderate
7	0.64	moderate
8	0.92	excellent
9	0.62	moderate
10	0.49	poor reliability
11	0.55	moderate
12	0.48	poor reliability
13	0.72	moderate
14	0.75	good
15	0.75	moderate
CPIES sum	0.92	excellent

6.4 Discussion

The CPIES was developed as a concise self-report instrument under review) specifically designed to assess the professional identity of chiropractors and chiropractic students. While the preceding chapters have outlined explorations of the psychometric properties of the CPIES using methods such as exploratory factor analysis and internal consistency reliability, test-retest reliability remained untested, making it a crucial aspect to investigate in this

study. Therefore, the primary objective of this research was to evaluate the test-retest reliability of the CPIES.

The results suggest that the CPIES demonstrates an excellent test-retest reliability, supported by the high ICC estimates across the two survey occasions. The ICC was selected as the chosen metric for assessing test-retest reliability due to the utilisation of a Likert scale response format within the CPIES for capturing attitudes or opinions on CPI. Despite the Likert response involving the assignment of scores based on the extent of agreement or disagreement with a statement, it is conventionally treated as an ordinal rather than a categorical variable (Sullivan & Artino, 2013).

A limitation of the present study was the sample size. Estimations for adequate sample sizes in test-retest reliability vary. While the sample size in this study was comparable to numerous other test-retest reliability studies (Green & Young, 2001), some researchers suggest a minimum of 30 (Bonett & Wright, 2015) or even 100 participants (Kennedy, 2022). Larger sample sizes reduce the standard error of the statistics, and small sample sizes may lead to instability in the coefficients (Dutil et al., 2017). Therefore, caution must be exercised when interpreting the results of this chapter. However, the almost perfect and very strongly correlated CPIES test-retest reliability in this sample shows potential generalisability strength.

Additionally, there are inherent limitations with the test-retest methodology itself. For instance, the repetition that is part of the test-retest method may sensitise the respondent to the subject matter, as it is no longer novel on the second administration of the test, potentially impacting its stability and influencing their responses (Dutil et al., 2017; Scharfen et al., 2018). Therefore, generalising the results of the CPIES to other populations should be done cautiously, as its applicability may be limited to the student population.

The development of professional identity is a dynamic process that continues to evolve from undergraduate study to one's professionals life as a practitioner (de Lasson et al., 2016; Trede et al., 2012). However, it is important to acknowledge a limitation of this study related to the sample population. The participants in this study were students who are in a phase of transition, where they are identifying role models, experimenting with unfamiliar behaviours, evaluating their progress, and constructing possible identities (Ibarra, 1999).

Therefore, it is possible that these students may not yet have a fully formed a professional identity. To enhance the generalisability of findings, further research could consider evaluating test-retest reliability in other populations such as chiropractic educators and practicing chiropractors.

A very common limitation in evaluating the psychometric properties of assessments is the lack of relevant psychometric information in published studies (Bardhoshi et al., 2016). In this study, a key limitation was the absence of a true “gold standard” to objectively compare the CPIES with. However, a strength of the study is the excellent ICC obtained. Future research should investigate the CPIES sensitivity to detect change and its ability to predict CPI. This could include employing the CPIES at pertinent points in one’s career, such as when one graduates compared to when one retires, when one starts their own chiropractic clinic or when one’s practice style or practice orientation changes. These areas all provide avenues for future research.

It is important to recognise that the participant matching approach based on the three predetermined characteristics created additional limitations in this study. This criteria imposed constraints by reducing the sample size and potentially introducing some degree of error into our findings. Unfortunately, many pairs of scoring results were excluded because the T2 score of the pair could not be identified due to a study design error. This may have introduced a bias by including only those observations that can be matched by virtue of the uniqueness of their ethnicity/age/gender combination. Anonymity could have been better managed by allocation of a study specific ID that the student remembered for the second test time.

Exploring the state-trait continuum of CPI could benefit from additional research endeavours in the future. While the current test-retest reliability findings indicate that the CPIES leans towards measuring a trait-like characteristic, a comprehensive investigation would entail a more intricate approach. To attain a more precise understanding, a prospective study could involve incorporating three distinct time points for data collection, allowing for a more nuanced observation of any potential fluctuations in the construct being measured. Furthermore, refining the analysis could involve the utilisation of advanced statistical techniques such as Generalisability Theory which employs at least three time points (Medvedev & Siegert, 2022). This approach would offer a more comprehensive and robust

evaluation, accounting for various sources of variability and measurement error, and providing a clearer delineation between state-like variability and trait-like stability within the context of the CPIES measurements. This multifaceted approach would contribute to a more refined comprehension of the state-trait dynamics inherent to the CPI construct.

6.5 Conclusion

This study represents an investigation into the test-retest reliability of the CPIES. The findings indicate that the CPIES exhibits good to excellent test-retest reliability as evidenced by high ICC estimates. Furthermore, item-level responses generally showed moderate agreement across the two survey occasions, as indicated by the ICC. However, future research is warranted to further expand the psychometric analysis of the CPIES, which could contribute to its broader utilisation and understanding.

Chapter 7: Integrated Discussion and Conclusion

Prelude

Since the inception of the chiropractic profession, debate has revolved around varying practice objectives and philosophical approaches to patient care. While political and academic leaders within the profession have largely dominated the discourse little was known on the perspectives of everyday chiropractors regarding their professional identity.

Conceptually, professional identity is a dynamic construct, as one's individual identity emerges from a personal and socio-cultural context, that is also socially constructed over time. A robust professional identity plays a vital role in garnering recognition by society, fostering practitioner confidence and satisfaction, and potentially, improving patient outcomes.

Prior to the current research conducted for this thesis, there was a lack of clarity surrounding the concept of CPI, including the absence of a coherent definition. This prior lack of understanding may have hindered the consistent and supported development of the professional identity for chiropractors and impeded the practical application of this construct. The pursuit of the objectives underpinning this thesis commenced with a comprehensive exploration of the history of the chiropractic profession, particularly within the context of New Zealand (Chapter 1). This groundwork provided context for a deeper understanding of professional identity, as elucidated in Chapter 2. These initial phases served as critical cornerstones, significantly enriching the thesis's overall value and scope.

The overarching aim of this research was to shed light on the concept of CPI. This quest unfolded through a series of interconnected research objectives. Firstly, the study sought to understand the current perceptions of CPI held by practising chiropractors, which was explored in detail in Chapter 3. The focus of Chapter 4 aimed to identify the essential components necessary to formulate a comprehensive definition of CPI. Subsequently, the research delved into the identification of themes and elements that should be encompassed

in the development of an initial measurement scale for assessing CPI. This multifaceted aspect of the study spanned Chapters 4 and 5. Fourthly, the research set out to construct a measurement scale, complete with composite subscales designed to operationalise CPI. These scales' psychometric properties were rigorously evaluated through psychometric analysis, a process discussed in Chapters 5 and 6. Lastly, in Chapter 5, the research scrutinised whether any discernible subtype group differences existed in composite scores derived from the CPI scale.

7.1 Chapter and Study Summaries

According to the World Health Organisation, chiropractic is characterised as “a healthcare profession focusing on the diagnosis, treatment, and prevention of neuromusculoskeletal (NMS) disorders and their impact on overall health. The practice emphasises manual techniques, including joint adjustments and manipulation, with particular attention to subluxations (World Health Organisation, 2005, p.3)”. A careful assessment of this definition reveals the diversity of profession-specific knowledge within chiropractic. Given the wide range of therapeutic and practice approaches, it becomes crucial to assess the current state of knowledge regarding practicing chiropractors' perspectives on CPI (Chapter 3).

The first published paper of this thesis, a critical literature review presented in the third chapter of the thesis, was conducted to address the first objective of this thesis confirmed the existence of three previously identified professional identity subgroups in the chiropractic profession (Glucina et al., 2020). These subgroups include two polarised approaches, one being a short-term, biomedically focused MSK treatment style (Chapman-Smith, 2005; Glucina et al., 2020, 2024; Nelson et al., 2005; WFC Task Force Presentation, 2005), and the other being a long-term, vitalistic VS wellness focus style of practice (Glucina et al., 2020, 2024; Hawk et al., 2005; Jolliot, 2006; Senzon, 2011; WFC Task Force Presentation, 2005). Among the chiropractic profession, there is a significant group known as centrists*,* who incorporate the traditional philosophy of VS-focused chiropractic while also pursuing a practice objective of treating general MSK complaints (Glucina et al., 2020, 2024; Good, 2010; WFC Task Force Presentation, 2005).

Vertebral subluxations are believed to result from biomechanical derangements of the spine due to bodily stresses, leading to significant maladaptive effects on neurological function and sensorimotor integration (Haavik-Taylor et al., 2010; Henderson, 2012). Chiropractic intervention, through the adjustment, focuses on analysing and correcting VS. In contrast to the VS approach, the MSK framework of chiropractic care centres around improving dysfunctional joints through mobilisation, (Schneider et al., 2016). Some chiropractors with an MSK-focused practice objective criticise those with a VS-focus, suggesting that they adhere to older concepts where subluxation is considered the cause of all disease, despite the evolution of VS theory (Haavik-Taylor et al., 2010; Kent, 2018a; Senzon, 2018a).

Furthermore, in the third chapter, it was revealed that chiropractors perceive themselves as primary care practitioners. They embrace a broad scope of practice that extends beyond MSK interventions, encompassing NMSK and organic-visceral approaches, catering to diverse patient demographic groups (Glucina et al., 2020). While approximately 20% of chiropractors identify exclusively as VS-focused practitioners, this PhD research investigation unveiled that the consideration of VS is significant for a much larger proportion, potentially exceeding 70% of chiropractors (Glucina et al., 2020). This finding constitutes a novel and unique contribution to the empirical knowledge base. However, the precise quantification of exclusive MSK practitioners and those in centrist groupings remained undisclosed.

In Chapter 4 of this PhD research, the lack of a uniform definition for CPI was addressed which also sought to fulfil the second objective of this project. The concept analysis approach of Walker and Avant (2005) was employed to define CPI, which constituted the second objective of this project. This approach involved identifying the core characteristics and attributes associated with the CPI concept, drawing on the main attributes of professional identity in diverse healthcare professions and assessing their relevance within the context of chiropractic.

This research, which also answered the third objective of this research, found that CPI encompassed six broad attributes or domains which included: knowledge and understanding of professional ethics and standards of practice, chiropractic history, practice philosophy and motivations, the roles and expertise of a chiropractor, professional pride and attitude, and professional engagement and interaction behaviours (Glucina et al., 2023a). These domains were not considered to be mutually exclusive and may overlap. The definition derived from

this concept analysis was that CPI is: “a chiropractor’s self-perception and ownership of their practice philosophies, roles and functions, and their pride, engagement, and knowledge of their profession (Glucina et al., 2023a, p.80)”.

The themes identified in Chapter 4, addressed the third objective of this research, and served as a foundation for the examination of the fourth and fifth objectives of this project detailed in Chapter 5. This submitted study as part of the thesis project, utilised a top-down approach to address the lack of a measurement instrument for assessing professional identity among chiropractors. The domains of CPI from Chapter 4 were used to develop a profession-specific instrument scale employing a mixed-methods sequential exploratory design where qualitative inquiry preceded the quantitative analysis of survey items (Glucina et al., 2024). Feedback was obtained by 15-expert key informants through one-to-one cognitive interviews, and candidate items were administered to Board-registered chiropractors and chiropractic students through an online survey. Various psychometric analyses, including conceptually guided exploratory factor analysis (EFA), were employed to evaluate the suitability of the candidate items (Glucina et al., 2024).

Building on the development of the Chiropractic Professional Identity Embodiment Scale (CPIES), the subsequent psychometric analysis revealed that CPI could be reliably measured through six individual subscales or through one 15-item unidimensional scale. Statistical analyses found no significant differences in CPIES scores (e.g., demographic variables, graduating institution etc.) among participants, except for self-categorisation of identity subtype. As the unidimensional scale showed good reliability, Chapter 6 evaluated the test-retest reliability to add to the psychometric robustness of the CPIES also fulfilling the fourth objective of this thesis project. The unidimensional CPIES demonstrated excellent test-retest reliability with individual CPIES responses generally showing moderate test re-test reliability across two survey occasions.

Finally, in the present chapter, Chapter 7, the research findings are summarised and discussed in relation to professional identity and in particular, the CPI framework. Following the discussion, this chapter will highlight practical applications of the findings, identify potential directions for future research and present conclusions drawn from the study.

7.2 Novel Contributions, Implications and Future Research from this Thesis Project

This research has made noteworthy contributions by identifying and effectively addressing four key gaps inherent to the chiropractic field. These contributions hold substantial importance, as they encompass the attainment of a clearer understanding of CPI, the creation of an assessment tool for CPI evaluation, a future focus for the profession, and an enhanced comprehension of the broader profession concerning practice orientations.

7.2.1 Clarifying Chiropractic Professional Identity

A clear professional identity is essential for external stakeholders including patients, healthcare providers, and policymakers. It enables patients to make informed decisions about their healthcare options, builds trust in chiropractors as healthcare providers, and enhances interdisciplinary collaboration (Glucina et al., 2020, 2023). Inadequate articulation of professional identities among collaborators can lead to confusion about roles, conflicts related to power and status, and the proliferation of professional stereotypes, all of which hinder effective interprofessional collaboration (King & Ross, 2003). A clear and well-defined professional identity serves as a pivotal framework that sheds light on the behaviours and practices of healthcare providers, culminating in more consistent and effective patient care (Kasperiuniene & Zydziunaite, 2019; Lifshitz-Assaf, 2018; Sawatsky, Santivasi, et al., 2020).

The importance of having a clear understanding of professional identity cannot be overstated (Brosnan, 2017; Duenas et al., 2003; Smith & Carber, 2009), and the outcomes of this thesis research will help to reduce confusion surrounding CPI. The findings of this study revealed a consistent pattern where CPI was found to incorporate a diverse and intricate tapestry and complex interplay of values, beliefs, experiences, and philosophies about one's work specific to the chiropractic profession (Glucina et al., 2020, 2023). Distinguishing one profession from another, particularly when they appear similar, can significantly influence professional identity (Pistole & Roberts, 2002). Further complicated by a lack of clarity surrounding its own identity, this is especially relevant for the chiropractic profession, which may be perceived as like other manual therapies (Carnes & Fawkes, 2012).

The significance of this thesis work lies in its capacity to enhance our comprehension of the crucial construct that is CPI. Through the revelations of distinct CPI domains and the subsequent establishment of a comprehensive definition, this thesis research paves the way for the operationalisation of the CPIES and its component subscales. Within the chiropractic community, this advancement holds the potential to pinpoint areas that can be further nurtured and developed to promote a stronger professional identity. This not only benefits individual practitioners, but ripples out to elevate the entire chiropractic profession, the wider community, and most importantly, the well-being of chiropractic patients.

7.2.2 Implications of a Clearer Understanding of Chiropractic Professional Identity

Prior to the initiation of this study, the concept of CPI remained largely unexplored, lacking comprehensive investigation. The objective of this thesis project was to better understand the professional identity of practicing chiropractors. From this knowledge, it was ascertained that the construct was far more intricate than practitioner subtypes alone (Glucina et al., 2020). This novel finding revealed the pressing need for a deeper comprehension of CPI, ultimately paving the way for research that uncovered the six domains of CPI that formulated a precise definition (Glucina et al., 2023).

7.2.2.1 Positive impacts for health and well-being

A clear professional identity provides a valuable framework for understanding the behaviours and actions of health professionals, leading to more consistent and effective patient care (Kasperiuniene & Zydziunaite, 2019; Lifshitz-Assaf, 2018). Cultivating a clearer understanding of one's professional identity can enhance practitioner confidence and promote enhanced decision making, leading to improved communication and health outcomes for patients (Sawatsky et al., 2020).

The benefit of a cohesive professional identity offers far-reaching benefits that extend beyond individual well-being and can positively impact various aspects of health and life. A cultural shift towards promoting professional resilience, rather than solely focusing on burned-out practitioners, has been observed across health disciplines such as medicine

(Panagopoulou & Montgomery, 2019). A crucial element in this shift is the presence of a strong professional identity, which empowers practitioners to find purpose and meaning in their work, which in turn, leads to enhanced well-being (Ben-Itzhak et al., 2015; Branch et al., 2017; Depner et al., 2021) and increased happiness (Tak et al., 2017).

Importantly, the benefits of a coherent professional identity have a ripple effect. For example, living with purpose, which is fostered by a strong professional identity, has been associated with a range of improved health outcomes. These include experiencing positive emotions, reduced anxiety, and increased self-esteem (Kashdan & McKnight, 2013), engaging in higher levels of physical activity (Hooker & Masters, 2014), enjoying improved sleep (Kim et al., 2015), adopting a greater use of preventive health services (Kim et al., 2014), and even demonstrating a reduced risk of all-cause mortality, stroke, and dementia (Boyle et al., 2009).

Chiropractors can experience comparable improved health outcomes that enable them to thrive and find greater fulfilment in their careers, ultimately contributing to their own health and well-being. These benefits extend beyond the individual practitioner, positively impacting the wider community by reducing health-related expenditures associated with suboptimal health outcomes. Through investing in their professional identity and hence well-being, chiropractors can actively contribute to fostering a healthier community while simultaneously reducing healthcare costs.

7.2.2.2 Professional collaboration

Despite the ongoing challenge within the chiropractic profession to establish a unified professional identity, there is an increasing recognition of the importance of interprofessional collaboration with related helping professions as a best-practice approach (Myburgh et al., 2022; Riva et al., 2010; Salsbury et al., 2018). The findings from this research can play a significant role in facilitating and enhancing interprofessional collaboration.

While positive perceptions of the chiropractic profession have been observed within midwifery (Mullin et al., 2011), negative attitudes persist among physicians, orthopaedic

surgeons, and obstetricians, partly due to perceived variability in approaches (Busse et al., 2009, 2021; Weis et al., 2016; Wong et al., 2013). Clarity surrounding one's CPI ultimately enables practitioners to reflect on and address areas of their CPI that may require support; serving as a means to strengthen their professional identity (Glucina et al., 2020).

By bolstering professional identity and clarifying objectives, the chiropractic profession can improve collaboration and be recognised as valuable members of multidisciplinary teams. However, it is essential to acknowledge that research on the relationship between collaboration and professional role identity across different disciplines is limited (Adler et al., 2007; Touati et al., 2019). While multidisciplinary collaboration is considered best practice, there appears to be a knowledge gap that warrants further extensive study. This could, in turn, foster more robust collaboration with other healthcare professionals, promoting a more integrated and coordinated approach to patient care. Therefore, the findings of this PhD study contribute not only to theory but also offers practical insights that can drive positive changes in healthcare practice.

7.2.3 A Tool to Measure Chiropractic Professional Identity

As a result of the acquired knowledge on the state of CPI and clarifying its components, the operationalisation of the CPI construct was made possible. This occurred through the creation and validation of the CPIES instrument (Glucina et al., 2024). The CPIES, along with its individual subscales, holds promise in evaluating one's professional identity, recognising strengths and areas needing improvement, and shaping effective interventions and developmental programs. Although the reliability of domain subscales exhibited variations, the subscales can serve as discussion aids, providing a broader assessment of CPI facets for more comprehensive development.

The empirical evidence stemming from the development of the CPIES tool and the subscales, lends support to both a unidimensional and multi-domain approach in measuring CPI. This instrument, accompanied by its component subscales, offers insights into the evolution of chiropractic practitioners and students, identifying potential obstacles to growth among specific segments of the chiropractic community (Glucina, et al., 2024).

With the availability of the CPIES instrument, a highly valuable resource emerges for the effective measurement and reinforcement of professional identity within the field of chiropractic. This scale presents a significant contribution to the realm of chiropractic by providing a robust and validated tool for evaluating CPI. Several notable strengths of the CPIES include its validity and reliability, including test-retest reliability.

7.2.4 Implications and Future Research of the Chiropractic Professional Identity Embodiment Scale

Gaining a deeper understanding of CPI, and its potential impacts is crucial for advancing professionalisation and recognition within the healthcare arena (Glucina et al., 2020). To further explore the impact of CPI on various aspects of chiropractic practice, future research can utilise the CPIES (Glucina, et al., 2024), and the CPI framework (Glucina et al., 2023a) developed in this thesis. Researchers can investigate how CPI influences important factors such as student development, clinical decision-making, patient outcomes, career satisfaction, and the public perception of the chiropractic profession.

7.2.4.1 Professional Identity Development and Formation

Moving forward, it is essential to consider the areas of professional identity development (PID) and professional identity formation (PIF) which are terms with subtle differences often used interchangeably (Cullum et al., 2020). According to Janke et al. (2021), PIF encompasses the internalisation and demonstration of behavioural norms, standards, and values of a professional community. This can be compared to PID, a concept by which one's professional identity becomes a way of being, providing a lens to learn, evaluate and make sense of one's practice (Trede et al., 2012). While this thesis research has not specifically delved into PID and PIF, it presents an avenue for future investigation.

The development and formation of professional identity are dynamic processes that unfold in successive stages (Stull & Blue, 2016). Unlike a passive or linear progression, establishing a professional identity requires active engagement in navigating and reconciling the tensions between one's personal identity and the established professional norms (Cruess et al.,

2014). It involves iterative self-reflection, integration, and adaptation, where individuals harmonise their unique perspectives with the profession's values and expectations, fostering diversity (Frost & Regehr, 2013).

PID and PIF are crucial aspects of healthcare professions (Adams et al., 2006; Matthews et al., 2019), and have been extensively studied among students in fields such as medicine (Buck et al., 2019; Wilson et al., 2013) and nursing (Cowin et al., 2013). However, research on PIF among chiropractic students remains notably limited. The dataset extracted from the student cohort in this research had inherent limitations, possibly contributing to the absence of significant findings across academic years. Consequently, future targeted investigations encompassing multiple year levels are advisable.

On a global scale, research efforts have predominantly centred on the perceptions and attitudes of students concerning the chiropractic profession and its prospective trajectory (de Luca et al., 2018; Gliedt et al., 2012, 2015; Swain et al., 2021). While this thesis employed the CPIES in chiropractic institutions, future prospective systematic inquiries within chiropractic programs hold the potential to illuminate disparities in professional identity not only across various student year levels but also among differing educational establishments. Notably, the impact of the COVID-19 pandemic on poor PID among healthcare practitioners should be considered in future planning by educators, institutions, and organisations (Cullum et al., 2020).

7.2.4.2 Informing Pre and Post Graduate Educational Content

As professional identity is an ongoing and evolving process, chiropractic educators at institutions should regularly revisit and reinforce their own professional identity (Brosnan, 2017). Research focusing on CPI can help facilitate this. Therefore, the use of a validated instrument such as the CPIES is of vital importance for chiropractors in practice, chiropractic educators, and the profession.

To cultivate a progressive sense of professional identity among chiropractic students, educators must adopt a systematic approach to curriculum design. This approach involves creating conducive learning environments that consistently emphasise key aspects of

professional identity from early education through graduation. Achieving this goal requires the utilisation of diverse teaching methods, including reflection, supervision, practical experiences, and instructional techniques (Littlefield, 2016). The implications of this thesis research extend to enhancing training standards and providing practical guidelines for professionals and educators to assess and strengthen their own professional identities as well as those of their students.

In the context of programs and ongoing professional development, investigating potential shifts in CPI during postgraduate years offers insights into the stability or variability of CPI over time. These insights contribute to a deeper theoretical understanding of this significant concept. The outcomes of this thesis study serve as a foundation for structuring and evaluating initiatives in continued professional education and development. Engaging in these endeavours enables chiropractors to not only strengthen their professional identity but also to reap its benefits, including heightened career achievements (Allen, 2011), personal well-being (Monrouxe, 2010), and protection against burnout among healthcare professionals (Sabancıogullari & Dogan, 2015). A robust professional identity plays a pivotal role in nurturing confident, successful, and resilient healthcare practitioners (Cullum et al., 2020). Chiropractic programs can contribute to the profession by offering seminars, workshops, and advocacy platforms, further reinforcing practitioners' professional identity, and fostering their success.

7.2.4.3 Utilising the CPIES in Conjunction with Instruments and Patient-Reported Outcome Measures

Future research can explore integrating the CPIES with other patient-reported outcome measures (PROMs) and instruments to comprehensively evaluate chiropractic care beyond symptom alleviation. For example, quality of life PROMs such as the WHOQOL-BREF (WHOQOL Group, 1998), instrument can investigate potential relationships between professional identity and patient health outcomes, enhancing the patient-centred focus.

Instruments used alongside the CPIES, such as the widely adopted Working Alliance Inventory (Horvath & Greenberg, 1989) for assessing therapeutic alliance, can contribute to investigating relationships between these constructs. Therapeutic alliance, conceptualised

by Bordin (1979), encompasses mutual goal agreement, consensus on interventions, and the strength of the interpersonal bond between the patient and practitioner. A robust therapeutic alliance has been associated with increased person-centeredness a critical aspect of modern healthcare (Hamovitch et al., 2018). The formation of a professional identity stems from the integration of knowledge acquired through meaningful patient interactions, results in a patient-centred professional identity (Barr et al., 2015; Brennan et al., 2010), and hence is relevant for both chiropractic students and practitioners alike.

Within chiropractic, patient-centeredness includes attentive listening, incorporating patient preferences, and crafting personalised care plans, which all contribute to optimal clinical outcomes (DeSouza et al., 2007; Stomski et al., 2019). Establishing a therapeutic working relationship with the patient is paramount for fostering patient-centred care (Mead & Bower, 2002). Notably, higher levels of therapeutic alliance have been associated with improved health outcomes in various fields, including manual therapies (Ferreira et al., 2013; Fuentes et al., 2014), and particularly within chiropractic (Lambers & Bolton, 2016).

The significance of patient-centredness in healthcare is underscored by its positive impact on communication, patient satisfaction, and overall health outcomes (Crawford et al., 2017; Kwame & Petrucka, 2021). By using the CPIES to assess professional identity and exploring its correlations with PROMs, potential links among professional identity, therapeutic alliance, and patient health outcomes in chiropractic care can be thoroughly investigated.

7.2.5 Future Focus: A Path Forward for the Profession

Exploring one's professional identity, guided by the CPIES and CPI construct, holds significant potential to promote intra-professional collaboration within the chiropractic field. In today's ever-evolving healthcare landscape, collaboration has emerged as a prominent and evolving trend. A stronger professional identity enhances individual's readiness for both inter- and intra-professional learning (Stull & Blue, 2016). However, realising this collaborative potential necessitates establishing greater cohesion and adopting a more inclusive attitude towards diverse practice styles and approaches within the chiropractic profession (Glucina,

2020). By overcoming these foundational challenges, the groundwork can be laid for a harmonious environment conducive to collective contributions that advance the profession.

The chiropractic profession faces three potential paths: maintaining the status quo, achieving unity, or experiencing division (Simpson, 2012). The findings from this thesis research can play a pivotal role in emphasising common ground and shared characteristics among chiropractors, rather than perpetually highlighting ideological differences. To achieve this, it is essential to focus equal attention on all six domains that constitute CPI (Glucina et al., 2023a), rather than disproportionately concentrating on philosophical orientation alone, which has historically dominated discussions (Gíslason et al., 2019; Glucina et al., 2020; McGregor et al., 2014; Reggars, 2011; Villanueva-Russell, 2011; Walker, 2016). By implementing or promoting continuing professional programs, education, and research on the five additional domains (knowledge and understanding of professional ethics and standards of practice, chiropractic history, the roles and expertise of a chiropractor, professional pride and attitude, and professional engagement and interaction behaviours) that comprise CPI, the chiropractic profession can embrace a more balanced approach, fostering greater unity and growth. As articulated in a published paper resulting from this thesis research, "through continued focus and exploration of evolving chiropractic professional identity, a more coherent identity may be possible, which could involve celebrating and embracing its diversity (Glucina et al., 2020, p.12)."

7.2.6 Implications of Improving the Wider Organisational Promotion of CPI

Professional disharmony resulting from internal political conflicts negatively impact chiropractors' confidence, self-esteem, and overall professional satisfaction (Glucina et al., 2019). To address these challenges, a unified approach within the chiropractic profession is essential, particularly from influential organisations like the World Federation of Chiropractic (WFC). Such an approach should recognise and celebrate the inherent diversity in chiropractic while also clarifying the professions' role in relation to other healthcare disciplines (Glucina et al., 2020).

Currently, it has been suggested that there is an agenda influenced by individuals in academic and political positions that emphasises and promotes a singular MSK approach to

chiropractic care, possibly driven by a desire for acceptance by other healthcare disciplines, such as medicine (Brosnan, 2017; Senzon, 2022; Villanueva-Russell, 2011). However, it is worth considering that greater progress for the profession might be achieved by embracing and accepting different practices instead of engaging in internal conflicts and "shooting from within" (Blum, 2019; Glucina et al., 2020; Senzon, 2014). To facilitate this transformative shift, influential figures within the profession can adopt an approach that embraces the incorporation of vitalistic or VS forms of care.

While some segments within the profession may express concerns that these concepts could be challenging for the public to grasp, empirical research has shown that adept communication and comprehensive education surrounding VS-centred care can positively influence public perceptions and dispel potential stereotypes associated with chiropractic care (Russell et al., 2016). Similarly, embracing a VS-focused care approach has been found to enhance understanding and appreciation among newly-introduced patients through education and communication (Russell et al., 2017). Therefore, organisations poised for progress have the potential to realign their operational strategies to resonate with chiropractors' diverse practices, ushering in a new era of practice that aligns with evolving patient dynamics and perceptions.

By implementing these strategies, organisations can develop targeted messaging to clarify the various approaches within chiropractic and promote enhanced collaboration among chiropractors as valued members of multidisciplinary teams. This collective approach would provide a more comprehensive representation of actively practicing members' views. Additionally, by including greater representation of chiropractors actively practicing, this approach can help unify a profession that has experienced significant fragmentation (Glucina et al., 2020; Senzon, 2022; Villanueva-Russell, 2011).

7.2.7 Competing Identities – Re-categorisation and Subtype Prevalence

The concept of professional identity has been a topic of considerable discussion in the literature with some suggesting that multiple factions or subtypes exist within various identities in chiropractic (McDonald et al., 2004; McGregor et al., 2014; Puhl et al., 2014;

Villanueva-Russell, 2011). In exploring subtypes or stratification within the chiropractic profession, McGregor et al. (2014) and Puhl et al. (2014) both investigated how educational background and practice perceptions contribute to intraprofessional conflicts. McGregor et al. (2014) revealed six distinct strata within the profession, challenging the traditional two-faction model, but faced criticism for confirmation bias and flawed methodologies (Senzon, 2022). Similarly, Puhl et al. (2014) linked factionalism among Canadian chiropractors to their education and views on practice, noting the impact on professional identity and interprofessional collaboration. However, this study was also criticised for critical flaws and biases, including historical inaccuracies and logical fallacies (Senzon, 2022).

There are calls for the profession to shift away from traditional chiropractic towards a more mainstream medical approach, emphasising a spine-centered method for treating back pain (Gliedt et al., 2015; Walker, 2016). However, achieving unity in this shift may come at the cost of marginalising traditional chiropractic practices (Puhl et al., 2014; Walker, 2016), leading some to advocate for a split within the profession (Simpson, 2012; Walker, 2016). Puhl et al. (2014) argue that both philosophy and the public's reasons for seeking chiropractic care shape the profession's identity, while the actual clinical practice of chiropractic is diverse (Walker, 2016), complicating efforts to unify around a single identity. Notably, some argue that VS should not define the profession's future, as it represents only a minority view within chiropractic (Gliedt et al., 2015; McGregor et al., 2014; Puhl et al., 2014; Walker, 2016). However, this thesis research shows otherwise.

This thesis presents findings that challenge the view that VS is merely a minority perspective. By confirming previous research and revealing a continuum of practice approaches, the data shows that VS remains an integrated aspect of chiropractic identity, particularly within centrist approaches. Notably, 21% of chiropractors reported exclusively focusing on VS, aligning with international research showing similar percentages ranging from 18.8% to 21.2% (Gliedt et al., 2021; Glucina et al., 2020; McGregor et al., 2014; Smith & Carber, 2008). These insights underscore the enduring presence of VS approaches within the profession, suggesting that it plays a more significant role than previously acknowledged.

Significantly, this research proposes a shift from the traditional three predominant practice approaches to a more nuanced continuum model comprising five categories. This re-categorisation became necessary after many chiropractors identified with multiple

categories, indicating overlapping practices rather than strict adherence to the three traditional, mutually exclusive groupings (Glucina et al., 2020). Among participants who selected a combination of VS and centrist approaches, 86.6% incorporated VS as a practice element. This finding exceeds the 70% reported in the critical review published as part of this thesis, where it was noted that the majority of practitioners incorporate VS elements into their clinical practice (Glucina et al., 2020). These results underscore the predominance of VS approaches within the profession and emphasise the need for a more comprehensive understanding and recognition of the diverse practice approaches within chiropractic.

Another notable finding is the substantial prevalence of centrist practice orientations among chiropractors, comprising a significant majority of 73.1% (refer to Table 5.4: affirmative response to groupings 2-4). Quantifying this centrist group, which was previously hypothesised to be a substantial portion of chiropractic subtype practice orientation, has been lacking precise figures in chiropractic literature until now. This thesis research, for the first time, presents a numerical representation, shedding light on the existence of a significant "silent" centrist faction within the profession (Glucina et al., 2020; Good, 2010).

7.2.8 Implications of Quantifying Practice Approaches

Traditionally, dialogues within chiropractic have primarily centred around the dichotomy between the VS and MSK approaches. However, the emergence of this silent centrist contingent not only offers a potential voice for the profession's future but also contributes to a more comprehensive and inclusive discourse within the chiropractic field (Glucina et al., 2020).

To gain a deeper understanding of this centrist group and explore other potential subtypes within the chiropractic profession, further research is warranted. Moreover, the development of new instruments designed to assess philosophical practice orientation would contribute significantly to examining the practitioner's philosophical motivations behind patient care. This could be achieved by closely examining items previously indicative of philosophical bias in the CPI scale prototype, which were subsequently excluded in the CPIES analysis from Chapter 5.

Exploring these items could serve as an entry point for the development of a new scale that captures the various philosophical perspectives within the chiropractic profession and their impact on clinical practice. Subtype orientation evaluation is just one among many avenues for future research, such as PIF, continuing professional development and the evaluation of patient health outcomes.

7.3 Limitations

While this thesis research approached professional identity as part of social identity theory, it is important to note that professional identity is a multifaceted concept with alternate perspectives. For instance, CPI could also be examined by considering its three constituent elements: collective professional identity, individual professional identity, and PID (Harwood, 2017).

Promoting a unified professional identity for chiropractic is a formidable, yet essential, task for leaders, educators, and practitioners. The search for effective tools capable of measuring shared professional identity constructs among current and prospective members is a critical step in reinforcing and fostering common attitudes, beliefs, and respect. However, the reliance on a single administration, primarily from members of one professional organisation and institution, may not offer a comprehensive understanding of the diverse components that constitute CPI (Littlefield, 2016), thus presenting a limitation to the current study.

In light of this limitation, recruitment for the quantitative aspects of this study was exclusively conducted online utilising Likert-scale questions. It is important to acknowledge that these methodologies come with inherent limitations, particularly in terms of accessibility and the possibility that participants may feel restricted in expressing responses that deviate from the options provided (Littlefield, 2016).

Furthermore, there are suggestions that a unified view of CPI may be more likely within individual countries (Jones-Harris, 2010). As the CPIES scale was developed within a NZ context, the generalisability of the findings may be limited. Therefore, further research is needed to examine the psychometric properties of the CPIES and explore the applicability of the findings in different contexts. Nevertheless, despite these limitations, the initial findings

offer valuable insights into conceptualising the professional identity of chiropractic professionals.

In addition, a limitation is evident within the re-categorisation process employed in this thesis. It could be argued that this re-categorisation, while aiming to simplify a complex construct, might inadvertently oversimplify it. A recent review conducted by Glucina et al. (2020) highlighted that previous research had initially identified six distinct strata groupings as a foundation for investigating subtypes. However, these initial six categories were ultimately condensed into two polarised perspectives: orthodox (MSK) and unorthodox (VS) (Gíslason et al., 2019; McGregor et al., 2014; Puhl et al., 2014).

Future research endeavours could potentially delve deeper into a more nuanced subtype categorisation approach. This could involve a clearer focus on capturing diverse practice approaches that may embody a centrist viewpoint, thus better reflecting the intricate landscape of this field.

7.4 Final Reflection

The process of undertaking this thesis has presented significant challenges, requiring extensive effort. Delving into the existing body of knowledge pertaining to the research topic proved to be a complex and demanding endeavour. Engaging in the critical analysis of various research studies and identifying their shortcomings in a tactful manner was an interesting aspect of this process.

An especially enlightening facet of the journey, when examining the second objective of this research, was the revelation of work in counselling on professional identity (Woo, 2014; Woo et al., 2014; Woo & Henfield, 2015). Woo (2014) has conducted extensive research into the professional identity of counsellors, with his research serving as a foundation for further exploration within the counselling field (Littlefield, 2016) as well as other disciplines, such as sign language teaching (Partington, 2017). The work of Woo provided a pivotal entry point for understanding general components of professional identity, facilitating the application of a comparable framework within the context of chiropractic.

The development, methodological refinement, and psychometric analysis of the CPIES required rigorous and sustained efforts. The lessons learned from these experiences will undoubtedly inform future research endeavours. Assembling all the components together in the final chapter of the thesis has been a challenging yet rewarding endeavour, signifying the culmination of this research journey.

7.5 Conclusion

The chiropractic profession has faced challenges in establishing a cohesive professional identity, and limited research has been conducted on the professional identity of chiropractors. This lack of a shared identity makes it difficult for chiropractors to articulate a clear professional identity and differentiate their profession from related health professions. However, clarifying CPI has significant implications, including enhancing patient care, promoting collaboration, and strengthening the profession's position in healthcare.

This thesis research proposes six major content areas of CPI. These include knowledge of professional ethics and practice standards, chiropractic history, practice philosophy and motivation, chiropractor roles and expertise, professional pride and attitude, and professional engagement and interaction behaviours. Chiropractic professional identity is defined as “a chiropractor's self-perception and ownership of their practice philosophies, roles and functions, and their pride, engagement, and knowledge of their profession (Glucina et al., 2023a, p.80)”.

By utilising the CPIES instrument, its domains, and the CPI construct, organisations, institutions, educators, and practitioners can gain a deeper understanding of the factors contributing to professional identity and tailor educational approaches accordingly. Amidst evolving demands and challenges, this enables a targeted and evidence-based approach to professional identity development, equipping chiropractic professionals with the necessary skills and attributes to thrive in both their professional life and practice.

In a rapidly changing global economy and professional landscape, there is a need for generalisable knowledge about effective approaches to the formation of a strong professional identity. This thesis contributes to the understanding of CPI and its assessment

through the creation and development of the CPIES and its component subscales. Evaluation of CPI through these means will offer valuable insights and help identify effective strategies for the development of a strong professional identity for chiropractors.

Exploring the interplay between intergroup behaviours, philosophical orientation, and professional identity is an avenue for future research. Understanding these dynamics of CPI and addressing them can inform strategies to reduce biases, promote inclusivity, and foster a stronger sense of unity among chiropractors. Further research is needed to delve deeper into these aspects to create a more integrated profession.

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Appendices

Appendix A1: AUTEC Approval

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

14 December 2021

Chris Krageloh
Faculty of Health and Environmental Sciences

Dear Chris

Re Ethics Application: 21/166 Contemporary chiropractic identity: Crystallising practice, typologies and outcomes

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 14 December 2024.

Non-Standard Conditions of Approval

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through http://www.aut.ac.nz/research/researchethics

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: , tanja.glucina@nzchiro.co.nz; kirsten.spencer@aut.ac.nz

Appendix A2: AUTEC Amendment Approval

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
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www.aut.ac.nz/researchethics

17 March 2022

Chris Krageloh
Faculty of Health and Environmental Sciences

Dear Chris

Ethics Application: 21/166 Contemporary chiropractic identity: Crystallising practice, typologies and outcomes

Thank you for submitting your request for an amendment to your ethics application.

The amendment to recruitment protocol is approved, subject to:

1. Revision of the advertisement to identify the researcher and that this research is being undertaken for a qualification;
2. Provision of an assurance that comments will be disabled on the social media posts;
3. Provision of the authorising signature in section F.3 of the amendment application.

Please provide us with a response to the points raised in these conditions, indicating either how you have satisfied these points or proposing an alternative approach. AUTEC also requires copies of any altered documents, such as Information Sheets, surveys etc. You are not required to resubmit the application form again. Any changes to responses in the form required by the committee in their conditions may be included in a supporting memorandum.

Please note that the Committee is always willing to discuss with applicants the points that have been made. There may be information that has not been made available to the Committee, or aspects of the research may not have been fully understood.

Once your response is received and confirmed as satisfying the Committee's points, you will be notified of the full approval of your ethics application. Full approval is not effective until all the conditions have been met. Data collection may not commence until full approval has been confirmed. If these conditions are not met within six months, your application may be closed and a new application will be required if you wish to continue with this research.

To enable us to provide you with efficient service, we ask that you use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

We look forward to hearing from you,

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: tanja.glucina@nzchiro.co.nz; kirsten.spencer@aut.ac.nz

Appendix A3: Chiropractic Interviews Advertisement

AUT
TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

VOLUNTEERS NEEDED FOR A CHIROPRACTIC RESEARCH STUDY

You are invited to be involved in a research project that is being run by the Auckland University of Technology. This study investigates chiropractors' beliefs and perceptions of chiropractic practice objectives, the profession and its identity. We will meet for a one-to-one interview or via Zoom or phone, for you to answer some questions, which is anticipated to take an hour or so.

To be eligible to participate, you need to:

- Be a NZ board registered chiropractor.

Please let us know via email if you would like to participate or would like more information.

Principal Investigator: Tanja Glucina
tanja.glucina@nzchiro.co.nz

Other Investigators: Associate Professor Chris Krägeloh, chris.krageloh@aut.ac.nz
Associate Professor Kirsten Spencer, kirsten.spencer@aut.ac.nz
Dr Kelly Holt, kelly.holt@nzchiro.co.nz

Approved by the Auckland University of Technology Ethics Committee on *14/12/2021 AUTEC Reference number 21/166*

Appendix A4: Chiropractic Interviews Participant Information Sheet

AUT
TE WĀNANGA ARONUI
O TĀMAKI MAKAU RAU

Participant Information Sheet

Date Information Sheet Produced:

21st May 2021

Project Title: Contemporary chiropractic identity: Crystallising practice, typologies and outcomes

An invitation:
Tēnā koe. My name is Tanja Glucina, and I am a PhD candidate from the Department of Psychology, School of Clinical Sciences at the Auckland University of Technology as well as a practising chiropractor. Thank you for taking the time to read this information sheet and expressing interest in my study. You are invited to take part in a one to one interview as part of research that examines chiropractors beliefs and perceptions of chiropractic practice objectives, the profession and its identity.

What is the purpose of this research?
The overall goal of this PhD project is to develop the understanding of chiropractic practice for both individual practitioners and for the chiropractic profession. This project that you are invited to, seeks to refine survey items and components of chiropractic professional identity, such as chiropractic philosophy, practice objectives and chiropractic professional identity. Data from this phase may be used in future post-doctoral research; individual information will be unidentifiable. The information gathered from this project alongside other project data, will be used to create a psychometrically robust professional identity scale that may identify practitioner subgroups. If you do decide to participate you are able to withdraw your participation at any time.

How was I identified and why am I being invited to participate in this research?
You have been identified as a potential participant for this research because you have either responded to a poster, heard through word of mouth, or via advertisement and have directly contacted myself or a member of the supervisory team and meet the criteria for this research project. You may speak to other chiropractors about this research and pass on project details and/or our contact details directly to them.

Eligibility
There are a number of reasons you might not be suitable for this project, these include:

- You are not a NZ board registered chiropractor.

How do I agree to participate in this research?

You have two weeks after reading this form to decide whether you would like to be interviewed. If so, please email me and let me know and we can arrange a time for the interview. Before the interview begins, you will need to complete a consent form to agree that you will participate in this research project.

Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed and allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

If you decide to participate in this study these are the things that will happen:

1. For this project, I (Tanja) will contact you and we will organise a time together for myself to visit you at a public location that is convenient for you for a one to one, interview. Alternatively, we could arrange a zoom meeting or phone interview. The interview will be more like an informal chat than a job interview. This interview is anticipated to take an hour or so.

2. The interview will be digitally recorded which I may playback if I feel I have missed something that you said. Yours and others input will be used to help me refine and revise my scale before we pilot test in the profession.

3. Data from this interview will be stored for six years. After that, and/or once all work on this project is fully completed, digital files will be erased, and computer files deleted.

4. It is anticipated that the results of this study will be written up as part of a PhD project, and may be presented at national and international conferences and submitted for publication in the scientific literature.

What are the discomforts and risks?

We do not anticipate that you will experience any discomfort. Your identity will be confidential, you can choose your own pseudonym, and all identifying information will be changed or deleted. If you are uncomfortable, you can let me know and we can change the topic we are discussing or stop the interview at any time.

Possible benefits

I imagine that the interview will be a relaxed chat about the topic, and I hope you find it enjoyable. There is also a broader benefit of gaining greater understanding about chiropractic professional identity and communication, a previously neglected area of research. You may be able to use our discussion/interview time on Group B CPD credits. Your participation will also assist me in completing one of the research projects towards my PhD qualification.

How will my privacy be protected?

Your privacy will be protected in that all recoded material will be confidential to the researcher and supervisors only. Your real name or any identifiable information about you (or any third party mentioned in the interviews) will not be used in any articles, reports or presentations produced as part of the research). All interview material will be confidential and consent forms will be held by the department in a secure location, separate from the research data for a period of six years.

What are the costs of participating in this research?
We do not anticipate you will incur any costs for taking part in this research. One to two hours of your time will be needed to conduct the interview.

What opportunity do I have to consider this invitation?
You may take time to consider whether you would like to participate in this research. We will contact you in two weeks' time.

How do I agree to participate in this project?
You can contact: Tanja Glucina by email tanja.glucina@nzchiro.co.nz or Associate Professor Chris Krägeloh by email chris.krageloh@aut.ac.nz

Will I receive feedback on the results of this research?
If you would like a copy of a summary of the research findings, you may indicate this on the consent form, and it will be emailed to you at the conclusion of my research project.

What do I do if I have concerns about this research?
Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Associate Professor Chris Krägeloh at chris.krageloh@aut.ac.nz
Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Dr Carina Meares, *ethics@aut.ac.nz* , 921 9999 ext 6038.

Cultural support
If you require Māori cultural support talk to your whānau in the first instance. Alternatively, you may contact the administrator for the AUT Māori Advisor by telephoning +64 9 921 9790

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:
Researcher contact details: Ms Tanja Glucina email: tanja.glucina@nzchiro.co.nz
Project Supervisor Details: Associate Professor Chris Krägeloh- chris.krageloh@aut.ac.nz

Thank you for expressing your interest in my study.

Approved by the Auckland University of Technology Ethics Committee on *14/12/2021 AUTEC Reference number 21/166*

Appendix A5: Chiropractic Interviews Consent Form

AUT
TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

Consent Form – Interviews

Project Title: Contemporary chiropractic profession in Aotearoa/New Zealand: Shifting practice and outcomes

Principal Investigator/ Researcher(s): Tanja Glucina.

Other Investigators/Supervisors: Associate Professor Chris Krägeloh, Associate Professor Kirsten Spencer, Dr Kelly Holt

- ○ I have read and understood the information provided about this research project in the Information Sheet dated May 21 2021.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that the interview will also be audio-recorded.
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ○ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ○ I consent to and understand that data from this project may be used in future post-doctoral research
- ○ I agree to take part in this research.
- ○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Declarations:
Participant: I hereby consent to take part in this study.

Participant's signature ____

Participant's name:_________________________________ Date :____________

Researcher: I have given a verbal explanation of the research project to the participant and have answered the participant's questions about it. I believe that the participant understands the study and has given informed consent to participate.

Researcher's signature ____

Researcher's name:_________________________________ Date :____________

Approved by the Auckland University of Technology Ethics Committee on 14/12/2021 AUTEC Reference number 21/66

Appendix A6: Survey Flyer

AUT
TE WĀNANGA ARONUI
O TĀMAKI MAKAU RAU

VOLUNTEERS NEEDED
to complete an online survey
FOR A CHIROPRACTIC RESEARCH STUDY

Project: Contemporary chiropractic identity: Crystallising practice, typologies and outcomes

As part of Tanja Glucina's PhD project, you are invited to take part in a research that is being undertaken by the Auckland University of Technology.

This study investigates views on the chiropractic profession through an online survey. This survey is self-explanatory, is expected to take up to 30 minutes and is simple and easy to do.

To be eligible to participate, you need to be:

- Be a registered chiropractor or chiropractic student
- Have a good comprehension of the English language and are able to complete an online form

If you would like more information please contact tanja.glucina@nzchiro.co.nz

Principal Investigator: Tanja Glucina.

Other Investigators: Associate Professors' Chris Krägeloh and Kirsten Spencer and Kelly Holt

Approved by the Auckland University of Technology Ethics Committee on 14/12/2021 AUTEC Reference number 21/166

Appendix A7: Social Media Advertisement

AUT
TE WĀNANGA ARONUI
O TĀMAKI MAKAU RAU

Chiropractors or Chiropractic Student
VOLUNTEERS NEEDED
to complete an online survey
FOR A CHIROPRACTIC RESEARCH STUDY

Project: Contemporary chiropractic identity: Crystallising practice, typologies and outcomes

As part of Tanja Glucina's PhD project, you are invited to take part in research that is being undertaken by the Auckland University of Technology.

This study investigates views on the chiropractic profession through an online survey. This survey is self-explanatory, is expected to take up to 30 minutes and is simple and easy to do.

The questionnaire is anonymous, and the data will only be used for scientific research purposes and educational examples. Your contribution is valuable and highly appreciated.

To complete the survey, please click on the link or use the QR code below. By clicking the link or by using the QR code, your consent to be a willing participant of the study will be indicated.

THANK YOU!

https://aut.au1.qualtrics.com/jfe/form/SV_72Io84V0ItLKAYu

Approved by the Auckland University of Technology Ethics Committee on 14/12/2021 AUTEC Reference number 21/166

Appendix A8: Survey Landing Page, Participant Information Sheet, and Consent Form

Landing Page, Demographics and Draft Survey

Dear Chiropractor or Chiropractic student,

The Auckland University of Technology are investigating chiropractors' professional identity. As an interested party of chiropractic, we would be grateful if you could complete this questionnaire. It takes about 10-30 minutes. The questionnaire is anonymous and the data will only be used for scientific research purposes and educational example. Your contribution is valuable and highly appreciated.

By clicking on the link below, you agree to participate in the study, your consent as a willing participant will be implied.

Completion of the questionnaire using the link below will be taken as indicating your consent to participate.

THANK YOU!

We will send a research summary out to this server when the project is completed.
Thank you in advance,

Tanja

https://aut.au1.qualtrics.com/linktothequestionnairetocome

AUT
TE WĀNANGA ARONUI
O TĀMAKI MAKAU RAU

Participant Information Sheet

Date Information Sheet Produced:

22nd June 2021

Project Title: Contemporary chiropractic identity: Crystallising practice, typologies and outcomes

An invitation:
Tēnā koe. My name is Tanja Glucina, and I am a PhD candidate from the Department of Psychology, School of Clinical Sciences at the Auckland University of Technology as well as a practising chiropractor. Thank you for taking the time to read this information sheet and expressing interest in my study. You are invited to take part in a survey that examines beliefs and perceptions of chiropractic practice objectives, the profession and its identity.

What is the purpose of this research?
The overall goal of this PhD project is to develop the understanding of chiropractic practice for individual chiropractors and the profession. This project seeks to refine survey items and components of chiropractic professional identity. The information gathered will be used to create a psychometrically robust professional identity scale that may identify practitioner subgroups. If you decide to participate you are able to withdraw at any time and individual information will be unidentifiable. Research findings may be used for academic publications and presentations and data from this project may be used in future post-doctoral research.

How was I identified and why am I being invited to participate in this research?
You have been identified as a potential participant for this research because you have either responded to an advertisement or heard through word of mouth about it and via the internet you have directly clicked the link to this landing page. You may speak to others about this research and pass on project details and/or the link to this survey.

Eligibility
There are a number of reasons you might not be suitable for this project. These include that you are not a chiropractic student or that you are not a NZ board registered chiropractor.

How do I agree to participate in this research?
By completing this survey you are indicating your consent to participate in this research. You can withdraw from the survey at any point, however, responses that you make along the way cannot be withdrawn. Individuals will be unidentifiable in any reporting of this research.

What do I do if I have concerns about this research?
Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Associate Professor Chris Krägeloh at chris.krageloh@aut.ac.nz
Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Dr Carina Meares, *ethics@aut.ac.nz* , 921 9999 ext 6038.

Approved by the Auckland University of Technology Ethics Committee on *14/12/2021 AUTEC Reference number 21/66*

Appendix A9: Supplementary Table S5.1

Supplementary Table S5.1

Original Items Tested for the Chiropractic Professional Identity Questionnaire

Domain or question block	Item Number	Item Statement
Chiropractic History	1	I can explain the difference between the philosophy of chiropractic and the philosophy of other manual therapies
	2	Chiropractic history and the philosophy of chiropractic is what sets it apart from other professions
	3	I can clearly explain DD Palmer's core chiropractic principles (e.g., universal and innate intelligence etc.)
	4	Chiropractors need to understand the traditional chiropractic theory that adjusting the spine corrects 'dis-ease'
	5	The concepts of universal and innate intelligence are relevant in today's chiropractic practice
	6	Vitalism/neo-vitalism has no place in contemporary chiropractic practice
	7	Contemporary evolving scientific evidence is more important than traditional chiropractic principles
	8	It is appropriate to allow for updating and enrichment of chiropractic theories based on current scientific advancements
	9	It is important to know that our chiropractic pioneers sacrificed so much (e.g., imprisonment for practicing medicine without a license) to allow chiropractic to be a recognised profession
	10	Foundational chiropractic concepts (e.g., tone) are still relevant in today's chiropractic practice
	11	Chiropractic sets itself apart from other health modalities in its equal emphasis on the art, philosophy and science of chiropractic (the three-legged stool)
Engagement and Interactions	1	I am aligned with the World Chiropractic Alliance identity statement that "chiropractic is the only discipline that focuses on correcting subluxations and reducing the stress that interferes with the body's ability to self-regulate and heal"
	2	I am aligned with the World Federation of Chiropractic identity statement that "chiropractors are the world experts in spinal health care within the health care system"

	3	Interdisciplinary collaboration with complementary and alternative health providers (e.g. naturopathy, acupuncture) is a strength for the chiropractic profession
	4	Interdisciplinary collaboration with mainstream health providers (e.g., physiotherapy and general practitioners) is a strength for the chiropractic profession
	5	I educate the community and public about my profession
	6	I actively engage in current research (e.g., being involved in a study, undertaking research)
	7	I keep up with scientific, theoretical and technique advancements in my profession (e.g., journals, books, seminars)
	8	On behalf of my profession, I advocate for chiropractic by participating in activities associated with legislation, law, and policy
	9	I seek feedback/consultation from chiropractic peers as a form of professional development
	10	I am engaged in discussions with other chiropractors about the identity and vision for our profession
	11	I have memberships to professional chiropractic associations (e.g., national and international groups and organisations)
	12	To foster professional development, I actively mentor others (e.g. students, graduates, experienced practitioners)
Ethics and Standards of Practice	1	Patients with severe spinal issues (e.g., spinal canal stenosis) should not receive chiropractic care and instead need to be referred to an orthopaedic surgeon or specialist
	2	A proficient chiropractor will use a diagnosis/clinical impression to help educate their patient and move them towards greater function
	3	It is important to maintain a mechanistic medical model perspective when conceptualising a patient's presenting concern
	4	Long-term care plans beyond the acute phase help patients to achieve a higher level of health, function, and performance
	5	Once a patient has improved and is asymptomatic, there is no reason to continue care
	6	Vertebral subluxation chiropractic practice styles often involve over-servicing
	7	Chiropractic care is beneficial for the patient irrespective of symptom change/improvement
	8	Rapid patient visit practices cannot fully serve their patients with the limited time they spend with them
Pride and Attitude	1	Chiropractic is predominately a wellness-based approach to health and wellbeing

	2	Chiropractic is predominately an evidence-based approach dealing with symptoms and disorders within our scope of practice
	3	I refer to other health professionals (e.g., medical doctors and physiotherapists) regularly
	4	Inter-professionally, I discuss vertebral subluxation with other health care providers
	5	Overall, I think I'd be happier if I were a different type of health professional (e.g., physiotherapist, medical doctor)
	6	I recommend my profession to those who are searching for a new career
	7	I believe the chiropractic profession is not as credible as other health professions (e.g., physiotherapists, osteopaths) with similar levels of training
	8	The public needs to understand what chiropractic has to offer and how it differs from other health care modalities
	9	Chiropractic education should be gained as post-graduate certification rather than through a full degree programme
	10	The chiropractic profession provides a valuable service to society
	11	The chiropractic profession is best served with a focus on providing a short-term relief model of patient care
	12	The chiropractic profession is best served with a focus on providing a long-term, wellness model of patient care
	13	Vertebral subluxation-based chiropractic is a risk to the profession being an accepted and respected member of the health care system
	14	Educational courses (e.g., rehabilitation) in chiropractic degrees and post-graduate workshops should be taught by chiropractors only
	15	Chiropractors need to understand the principles of evidence-based practice
	16	Continued lobbying efforts are essential to chiropractic gaining recognition by third-party payers
	17	I am comfortable meeting people who do not respect my profession
Philosophy and Motivations	1	I consider myself a Doctor of Chiropractic Medicine/ Chiropractic Physician
	2	Vertebral subluxation correction guides my clinical practice at each patient visit
	3	During a regular patient visit, it is a disservice to the patient to exclusively focus on vertebral subluxations
	4	I discuss vertebral subluxations and their impact on health with my patients

	5	The vertebral subluxation is the underlying cause of most health problems and clinical presentations
	6	Clinically, I assess for vertebral subluxation whilst also addressing patients' symptomatology
	7	Chiropractic's wellness perspective aims to help each person achieve health to their maximum potential
	8	I believe understanding a patient holistically (mind, body, and spirit) is essential
	9	I practice under traditional philosophical tenets of chiropractic (e.g., DD and BJ Palmer, RW Stephenson etc.)
	10	Patients should set their care plan based on their symptoms
	11	The adjustment is the same as spinal manipulative therapy
	12	The real reason chiropractic works are that interventions to body structure affect function
	13	The real reason chiropractic works are that adjustments correct nerve/nervous interference, which helps the brain and the body communicate better
	14	The chiropractic adjustment has benefits beyond neuromusculoskeletal conditions (e.g., it can help people with anxiety, depression, hypertension etc.)
	15	Chiropractic researchers should focus on physiological mechanisms of spinal manipulative therapy
	16	Chiropractic researchers should focus on outcomes/cost-effectiveness of integrative care models
	17	Chiropractic researchers should focus on the neurological mechanisms of chiropractic adjustments
	18	I term people that receive chiropractic as 'practice members' or 'clients' (or similar) instead of 'patients'
	19	A vitalistic chiropractor is a vertebral subluxation-based chiropractor
	20	The 3 T's (trauma, thoughts and toxins) are essential in communicating chiropractic concepts with my patients
	21	I call the application of chiropractic care an adjustment, even though I do not assess for vertebral subluxation
	22	A philosophically based chiropractor has the objective of locating, analysing and correcting vertebral subluxation
	23	Generally, I believe the body can heal itself without medicines (e.g. use of vaccinations, antibiotics for a respiratory infection)
Roles and Expertise	1	I consider my role to be akin to that of a manual therapist (e.g., osteopath, physiotherapist)

2	My practice function is primarily to rehabilitate musculoskeletal injuries
3	My practice function is primarily to get people well and stay well
4	It is a chiropractor's role to give lifestyle advice on nutrition, exercise and weight management, as well as mental and emotional health
5	I aim to treat a patient's symptoms
6	I aim to treat a patient's symptoms, improve wellbeing, and give choices about health
7	My primary role is to check the spine for nervous/nerve system interference
8	With appropriate advanced training, the chiropractic profession should expand its scope of practice to include prescribing medication
9	Chiropractors are well placed to safely provide care to infants and young children
10	I objectively measure patient's disability through outcome measures (e.g., Oswestry Disability Index, Roland Morris Disability Questionnaire, or other similar measures)
11	Multidisciplinary collaborative practice is the way forward for the chiropractic profession
12	X-rays are valuable in developing a patient's care plan
13	I consider myself an expert in spine care
14	Only chiropractors who have specialised post-graduate certification with particular subgroups should be able to work with them (e.g., only sports chiropractors should be able to work with athletes)
15	Patients with complicated chronic conditions (e.g., multiple sclerosis, diabetes) can benefit from chiropractic care
16	It is vital to make a differential diagnosis(es) or clinical impression(s) when seeing a patient
17	Chiropractors' primary role in health care should be to treat patients with neck and back pain and neuromusculoskeletal related conditions
18	Chiropractors should officially be able to diagnose patient's medical conditions (e.g., pulmonary disease, appendicitis, tremor disorders)
19	The public health care setting (hospitals and local emergency health centres etc.) are appropriate settings for chiropractic health care
20	The inclusion of clinical chiropractic training internships in integrative medical settings is essential to progress the profession
21	Extremity work is an integral part of chiropractic practice

Professional Identity Opinion	1	I am fundamentally a vertebral subluxation focused chiropractor
	2	I am fundamentally a musculoskeletal based, treatment focused chiropractor
	3	I am a centrist chiropractor; I share aspects of both vertebral subluxation, and musculoskeletal treatment focused chiropractic