University of Southampton

Faculty of Environmental and Life Sciences

Psychology

Chiropractor-Patient Working Alliance

by

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Thesis for the degree of Doctor of Philosophy in Psychology

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Abstract

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The working alliance embodies the complex dynamics of the practitioner-patient relationship. Although the alliance has repeatedly been shown to predict clinical outcomes in musculoskeletal care, chiropractic research has given it relatively little attention. The three papers featured in this thesis delve into the chiropractor-patient alliance and aim to offer valuable insights for clinical practice, thereby making a unique contribution to the field.

A mixed methods systematic review explored the alliance construct in the chiropractic literature. The quantitative synthesis found that few studies have measured the construct and its impact, with insufficient homogenous data for a meta-analysis. The qualitative synthesis suggests that chiropractic care can be considered a change process, where positive alliances ensure its cooperative nature.

A qualitative study explored alliance formation at the start of care from the perspective of patients attending a teaching clinic. The early alliance involved a process of gradually developing patients' confidence in their trainee chiropractor and the upcoming care journey. Reflecting on a described sense of vulnerability, patients emphasised that trainee chiropractors should validate their experience of pain by listening to and considering their needs, explanations, concerns, and preferences.

A longitudinal mixed methods study examined the temporal evolution of patients' perspectives on their alliance with trainee chiropractors. The quantitative results revealed that attachment-related anxiety and avoidance were negatively associated with patient ratings of the bond. The qualitative findings suggest that a positive trainee-patient bond is a prerequisite for establishing mutual agreement on the goals of care and collaboration on the treatment plan. Patients' appraisals of the alliance were influenced by their perceptions of the trainees' expertise, trustworthiness, diagnosis accuracy, and treatment plan utility.

The thesis illustrates that alliance progression is a dynamic process occurring in a pre-existing context that shapes the actions of the people operating within it. In the field of musculoskeletal care, diagnosing and treating chronic pain is not always a straightforward process. Practitioners skilled in managing this uncertainty in a psychologically informed manner by identifying, validating, and addressing patients' concerns within a secure and trusting relationship are crucial. By doing so, they can handle the psychological aspects of patients' pain experience, which is key to providing effective patient-centred care.

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Research Thesis: Declaration of Authorship

Print name: Dima Ivanova

Title of thesis: Chiropractor-Patient Working Alliance

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
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5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
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Abbreviations

AECCUC: AECC University College

AIC: Akaike Information Criterion

AMA: American Medical Association

AMED: Allied and Complementary Medicine Database

CAM: Complementary and Alternative Medicine

CI: Confidence Intervals

CR: Critical Realism

DPE: Doctor-Patient Encounter

ECR-R: Experiences in Close Relationships – Revised

ECR-RS: Experiences in Close Relationships – Relationship Scales

EEG: Electroencephalography

fMRI: Functional Magnetic Resonance Imaging

GCC: General Chiropractic Council

HIV AIDS: Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome

IC: Informed Consent

JBI: Joanna Briggs Institute

LBP: Low Back Pain

LMM: Linear Mixed-Effects Model

MCC: McTimoney College of Chiropractic

MMAT: Mixed Methods Appraisal Tool

NHS: National Health Service

PACIC: Patient Assessment of Chronic Illness Care

PCAS: Primary Care Assessment Survey

PICO: Population, Intervention, Comparison, Outcome

PICo: Population, Phenomena of Interest, Context.

PPAS: Physician-Patient Attachment Scale

Abbreviations

PPI: Patient and Public Involvement

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Prospero: International Prospective Register of Systematic Reviews

RTA: Reflexive Thematic Analysis

SCDTP: South Coast Doctoral Training Partnership

SD: Standard Deviation

SDM: Shared Decision Making

SSI: Riggio's Social Skills Inventory

TTA: Thematic Trajectory Analysis

UK: United Kingdom

US: United States of America

WA: Working Alliance

WAI: Working Alliance Inventory

WAI-12: Werkalliantievragenlijst

WAI-SR: Working Alliance Inventory – Short Revised

Chapter 1 Introduction

Extensive research has shown the impact of patient-practitioner positive relationships on patient outcomes, including reduced pain, improved physical function, and higher satisfaction with care (Bishop et al., 2021; Ferreira et al., 2013; Hall et al., 2010; Kinney et al., 2020). The Working Alliance (WA), also known as a Therapeutic or Helping Alliance, serves as a key construct for evaluating these relationships, representing the collaborative process between patients and practitioners aimed at achieving their agreed-upon goals (Bordin, 1979). This process also incorporates the development of interpersonal bonds, which facilitate patients' confidence in the treatment journey (Bordin, 1994).

The importance of positive alliances in chiropractic care cannot be overstated (Sherriff et al., 2023). While research and curricula have not fully embraced the significance of such psychosocial components, it is crucial to recognise that alliance strength predicts treatment outcomes for patients receiving musculoskeletal care (Gliedt et al., 2020). Despite the construct's descriptive conceptualisation in the literature, we need more insight into the mechanisms underlying alliance development (Babatunde et al., 2017; Elvins & Green, 2008). Scholars suggested that future research should explore this process to inform clinical practice and facilitate training (Sherriff et al., 2023).

Therefore, I delve into the intricate dynamics of patient-practitioner alliances in chiropractic care in this thesis. The journey begins in Chapter 1 with a reflexivity statement, discussing my personal, professional, and academic experiences that shaped the research design. We then uncover the historical roots of the alliance construct, initially rooted in psychotherapy but now extending its reach into various fields. From there, we examine how the alliance applies to musculoskeletal care, highlighting its role in physical health interventions. Additionally, we take a closer look at the chiropractic profession, dissecting theoretical frameworks and pinpointing areas where more research is needed. Lastly, we delve into the philosophical and methodological foundations that paved the way for this research.

1.1 Reflexivity Statement

According to Bhaskar, human agency refers to our ability to change our circumstances and ourselves through self-reflection (Bhaskar, 2013). He believes that we all have intentional agency and the capacity to reflect on and organise this agency, all within a deeply social context. Developing the skill of reflection allows us to engage thoughtfully with the world around us, leading to a heightened awareness of our lived experiences. In the realm of research,

reflexivity plays a crucial role in understanding knowledge production. Scholars emphasise that for researchers to go beyond mere technicians and become adept research practitioners, they must have the capacity for deep reflection (Mortari, 2015). This means reflecting on the practical aspects of research and the cognitive processes that shape our understanding of them. In other words, researchers should reflect not only on the knowledge they create but also on their role in its production (Mukumbang, 2023). Our positionality as researchers, including our identity, experiences, and values, impacts our work. I acknowledge my positionality in this reflexive statement and elaborate on the philosophical standpoint that influenced this research in subsection 1.6.

Having grown up in a working-class Eastern European family and lived in the UK for the last decade, my background has shaped my career goals and research interests. Before starting my PhD journey, I was a senior clinical trials assistant in a healthcare environment. I was involved in trials focusing on the effects of orthopaedic interventions on patients' pain, physical function, disability, quality of life, and psychological wellbeing. This experience ignited my interest in the biopsychosocial model, specifically its implications for mental and physical health, as it delves into the interplay of biology, psychology, and the social environment.

I began my SCDTP scholarship with an integrated MSc in September 2019, and after graduating, I commenced my PhD in September 2020. When applying for the scholarship, my supervisory team had already developed a preliminary research proposal examining the contextual factors within chiropractic care. The proposed research aimed to replicate a prospective cohort study conducted in the UK, which involved physiotherapists, osteopaths, and acupuncturists treating adult patients with LBP. The study measured the impact of patient-practitioner alliances, the healthcare environment, incidental treatment features, and patient and practitioner beliefs on patient back-related disability (Bishop et al., 2021). The results of the prospective study were concluded at the start of my PhD, with the authors reporting that patient alliance ratings were the most influential predictor across the three professions (Bishop et al., 2021). They recommended that future interventions should aim to assist practitioners in building positive relationships with their patients. Following the completion of the first paper of my PhD - a systematic literature review - it was evident that prioritising research on chiropractor-patient alliances would contribute to the existing body of literature due to identified knowledge gaps. As a result, the focus of my thesis was adjusted, adopting a mixed methods approach to study alliance development in the field more comprehensively. The research scope was broadened to include patients with musculoskeletal pain beyond LBP, recognising that musculoskeletal pain represents the primary reason for seeking chiropractic care in the UK (Sharp et al., 2018).

I have a background in psychology and aspire to pursue a career in the field. I hold a BSc in Psychology from Bournemouth University and an MSc in Social Research Methods in Psychology from the University of Southampton. This has given me a unique perspective on the role of practitioner-patient relationships, shaped by disciplinary norms within clinical practice. Coming from a different professional background, I was able to provide a fresh outlook on understanding patient experiences that chiropractors may not consider. Dealing with chronic back pain has helped me empathise with research participants and understand their experiences better.

I approached the research process without personal biases or preconceived notions about the profession, as I have no experience receiving chiropractic care. Additionally, I organised a Patient and Public Involvement initiative to shape the research design. I worked closely with practitioners to gain a thorough understanding of the clinical context and to help bridge any knowledge gaps that could impact my analyses. I also obtained permission to observe a treatment session and regularly attended the teaching clinic to familiarise myself with its policies and practices. This collaboration, along with the guidance of the multidisciplinary supervisory team throughout my PhD journey, provided invaluable practical insights and ensured more accurate data interpretation.

1.2 Definition, Conceptualisation, and Dimensions of Working Alliance in the Context of Mental Health

This section provides insight into the origins of the alliance construct. Since WA has been applied to various healthcare domains, knowledge of its historical roots in the context of mental health can offer a deeper understanding of its current applications and potential future directions. The importance of patient-practitioner relationships was first considered in psychoanalytic therapy, particularly in Freud's seminal works (Freud et al., 1991). He emphasised the role of transference - the human inclination to project feelings associated with past relationships onto present interactions (Freud, 1912a). Acknowledging the need for mutual collaboration, Freud described the patient-practitioner rapport as a prerequisite for an effective therapy journey (Freud, 1912b). Expanding on this notion, Rogers, the pioneer of the person-centred approach, noted that accurate empathy, congruence, and unconditional positive regard enable therapeutic change (Rogers, 1951). Accurate empathy involves the therapist actively listening to the client's feelings and thoughts and conveying a thorough understanding of the client's internal world, often through techniques such as reflection. Congruence requires the therapist to be transparent and genuine, sincerely conveying their feelings and thoughts without hiding behind a professional facade. Unconditional positive regard involves creating a

supportive atmosphere where clients feel accepted without judgment, allowing them to express themselves freely without fear of disapproval. Rogers implied that these three conditions can foster a safe environment, encouraging patients to engage in self-discovery and personal growth (Rogers, 1965).

With the rise of behavioural and cognitive-behavioural approaches, the role of the relationship was defined as strictly the context where patients learn the coping skills required to deal with challenges without the presence of a therapist (Muran & Barber, 2010). In line with this view, research prioritised measuring the effects of *"specific"* factors, that is, intervention techniques rooted in the theories underlying evidence-based practice (Butler & Strupp, 1986). The patient-practitioner relationship was portrayed as a secondary *"nonspecific"* factor that is auxiliary to the evidence-based techniques triggering the change process (Muran & Barber, 2010). Bordin (1994) argued that these competing views on the role of patient-practitioner relationships should be tested empirically (Bordin, 1994). The construct of WA, first coined by Greenson, was operationalised by Bordin to enable further scientific inquiry (Bordin, 1979; Greenson, 1965).

Bordin's conceptualisation emphasised that the strength of WA is essential for the change processes occurring in therapy (Bordin, 1979). He suggested that WA can be measured in terms of three dimensions: 1) a developed interpersonal bond between the individual seeking change and the change agent, 2) mutual agreement on the goals of the intervention, and 3) collaboration on the assigned tasks (Bordin, 1994). His theory was based on four main ideas. First, all forms of therapy necessitate an established positive alliance, with the nature of alliance varying based on the specific type of therapy. Second, the effectiveness of treatment is partly dependent on the alliance's strength. Third, different therapeutic approaches place distinct demands on the therapist and the client. Lastly, the strength of the alliance is determined by the compatibility of the demands of a particular alliance and the characteristics of the client and therapist. As a result of his conceptualisation, WA has gained prominence in research, theory, and clinical practice (Muran & Barber, 2010). Bordin (1979) stated in his pioneering paper:

> *I propose that the WA between the person who seeks change and the one who offers to be a change agent is one of the keys, if not the key, to the change process. The WA can be defined and elaborated in terms which make it universally applicable, and can be shown to be valuable for integrating knowledge - particularly for pointing to new research directions. As my initial statement suggests, a WA between a person seeking change and a change agent can occur in many places besides the locale of psychotherapy. The concept of the WA would seem to be applicable in the relation*

between student and teacher, between community action group and leader, and, with only slight extension, between child and parent.

(Bordin, 1979).

According to Bordin (1994), the relationship between the patient and therapist is established through a mutual contract, involving tangible exchanges (Bordin, 1994). He describes the concept of the bond as the emotional connection between therapist and patient, encompassing attributes such as trust, respect, and empathy. These attributes are influenced by the client and therapist's life experiences and the therapeutic approach utilised by the therapist. The activities and interactions between the therapist and patient give rise to different bonds. Trust is foundational, but deeper bonds can be fostered by exploring inner experiences in therapy. The bond can also be influenced by the therapist's role, which can vary from that of a caretaker to a consultant, with the therapist's level of responsibility depending on the therapeutic approach. Bordin (1994) suggested that the therapist-patient bond is crucial in therapy but requires further investigation to fully understand its role and nature.

The extent of mutual agreement and collaboration on the goals and tasks of therapy are intricately linked to the therapist-patient bond (Bordin, 1979, 1994). The concept of tasks involves the therapist's skills and the client's perception of the therapist's ability to facilitate change. It also consists of the collaboration between the therapist and client during therapy activities, the mutual agreement on tasks, and the timing of interventions. Even if a therapist possesses the necessary skills, poorly timed interventions can lead the client to view the therapist as unskilled. It is crucial for tasks to align with the client's lifestyle, worldview, and therapy expectations. The concept of goals focuses on mutual agreement and commitment to achieving therapy goals. Not only must the client and therapist agree on the goals, but the client must also perceive that the therapist is dedicated to helping them achieve these agreed-upon goals. These goals can vary depending on the presenting problem and the theoretical approach adopted by the therapist (Bordin, 1979, 1994).

Scholars have engaged in extensive exploration to map WA within the broader patient-practitioner relations (Fuertes, 2019). Within psychotherapy, a *“tripartite”* conceptualisation was proposed, describing the relations in terms of three components: 1) a WA, 2) a real relationship, and 3) a transference configuration (Gelso & Carter, 1994). First, within this conceptualisation, Bordin’s definition of WA is considered the professional purposive aspect of practitioner-patient interactions, which is essential for treatment success (Gelso & Carter, 1994). Second, the real relationship embodies the more personal aspect, where the human-to-human connection tends to surface in the clinical encounter (Fuertes, 2019). The real relationship is said to consist of two core dimensions: genuineness (the extent to which both

parties are authentic and honest) and realism (one's ability to perceive clearly and objectively the other party and the relationship as a whole) (Gelso et al., 2018). This conceptualisation also includes both magnitude and valence, the everchanging attributes of the two core dimensions of the real relationship (Gelso et al., 2018). Magnitude measures the extent or strength of realism and genuineness, representing the level to which these aspects are perceived by all parties involved. Conversely, valence pertains to the emotional quality or tone of realism and genuineness. It centres on whether the emotions associated with the real relationship are predominantly positive (e.g., warmth, trust, mutual respect) or negative (e.g., frustration, conflict, discomfort). Third, the transference configuration component encompasses projecting present feelings onto present patient-practitioner interactions as (Gelso & Carter, 1994; Greenson, 1965). Transference involves projecting actions from earlier relationships onto the therapist, often due to unresolved prior conflicts with significant others. Conversely, countertransference occurs when emotions, attitudes, and actions are transferred onto the client's case. Gelso and Carter (1994) noted that expectations play a significant role in this component (Gelso & Carter, 1994).

The *"tripartite"* conceptualisation offers valuable insight into how the three components interact. Gelso and Carter (1994) proposed that WA can influence transference configuration by promoting client awareness and expression of transference-based feelings while also minimising adverse transference effects (Gelso & Carter, 1994). Transferences occurring in the early phase of treatment can mirror clients' preconceived attitudes toward authority figures in general (Gelso & Carter, 1994). Resolving transference-based interpersonal conflicts can increase genuineness in a real relationship (Gelso & Carter, 1994). A genuine, real relationship can enhance alliance strength, which in turn helps both parties to have a clear and realistic perception of each other. The alliance embodies the sum of transference configuration, the real relationships and individuals' expectations of their roles in the treatment journey. It represents the patient-practitioner attachment, which can shape the progress of the therapy (Gelso & Carter, 1994). Considering such theorised interdependence, the authors raised a fundamental question: whether each component can or should be researched independently (Gelso & Carter, 1994). Findings from more recent meta-analyses suggest that while both real relationship and the transference configuration are associated with psychotherapy outcomes, the most empirically supported predictor is the alliance (Flückiger et al., 2018; Gelso et al., 2018; Hayes et al., 2018).

The debate in the psychology literature revolves around whether treatment effects operate through specific or nonspecific factors. Views on the role of the WA vary, with scholars in the field of cognitive behavioural therapy describing it as a nonspecific factor and researchers in psychotherapy defining it as a causal mechanism of change (Mulder et al., 2017; Zilcha-Mano et

al., 2019). Evidence indicates that the strength of alliance can predict treatment outcomes more accurately than specific techniques, highlighting the need to recognise its active role in the success of therapy (Zilcha-Mano et al., 2019).

While traditionally viewed as stable once formed, recent studies suggest that the alliance is a dynamic process evolving throughout care (Flückiger et al., 2022; Kramer et al., 2009; McLaughlin et al., 2014; Safran & Kraus, 2014). Psychologists have started distinguishing between trait-like and state-like components of WA, studying their distinct roles in treatment outcomes (Zilcha-Mano & Fisher, 2022). On the one hand, trait-like WA embodies stable individual differences in alliance strength, stemming from patients' and practitioners' intrapersonal and interpersonal characteristics. Patients with better interpersonal skills and positive expectations tend to form stronger trait-like alliances (Zilcha-Mano & Fisher, 2022). On the other hand, state-like WA reflects how the alliance develops within specific treatment contexts and is shaped by in-treatment processes. The severity of patients' interpersonal difficulties and their responses to treatment processes can influence state-like quality. In cognitive and behavioural therapy treatments, where the WA is theorised as a nonspecific factor, patient trait-like differences are expected to drive the alliance-outcome association. In other treatments, where WA is considered a central mechanism of change, state-like strengthening of the alliance is theorised to explain the alliance-outcome association (Zilcha-Mano & Fisher, 2022).

A systematic review included 37 studies examining the alliance as a potential mediator of symptom change, with data from 5530 patients (Baier et al., 2020). Of the 37 studies reviewed, 26 (70.3%) found evidence for the mediating role of alliance in psychotherapy despite significant heterogeneity between study designs, statistical analytic procedures, and overall quality. The authors imply that clinicians should prioritise cultivating alliance early in treatment, as it contributes to symptom reduction. Routine and systematic monitoring of the alliance using brief validated patient-rated measures can also assist them in tracking patient progress and making adjustments to therapy as needed (Baier et al., 2020).

A recent review was conducted to define and explain the therapeutic relationship in the context of treatment of alcohol and drug use and other behaviour change interventions (Magill et al., 2024). The authors performed qualitative content analysis to identify a set of principles and practices for clinicians. The generated principles and the practices can be categorised into three main areas: 1) Facilitating client behaviour change mechanisms (e.g., self-determination, motivation, self-efficacy), 2) Partnership considerations (e.g., aligning goals and tasks); and 3) Therapist interpersonal skills (e.g., empathy). The findings suggest that facilitating client self-determination involves therapists emphasising the client's expertise, choice, and responsibility

during the behaviour change process. This requires seeking permission before offering guidance, respecting the client's autonomy, and avoiding an overly expert stance to ensure clients feel in control and responsible. To foster client motivation, therapists must tailor their approach to the client's stage of change, exploring various factors that may influence motivation, including values, motives, and external perspectives. Therapists should respond to client ambivalence to change with patience and empathy, consistently seeking a verbal commitment to action without confrontation. Enhancing client self-efficacy involves discussing personal resources and past successes related to behaviour change. Therapists should create opportunities for clients to experience incremental successes and provide genuine affirmations to reinforce progress. Creating a partnership between the therapist and the client is also imperative. This involves mutually agreeing upon session agendas, therapeutic goals, and objectives and revisiting these goals at regular intervals. Therapists should prioritise negotiation in decision-making, using language that fosters shared responsibility, and attending to relational processes to ensure a collaborative environment (Magill et al., 2024).

Furthermore, the authors explained that demonstrating acceptance means therapists should communicate genuine appreciation for the client as a whole, including their strengths, limitations, and barriers to change (Magill et al., 2024). Showing empathy involves a genuine curiosity about the client's needs and experiences and using active and reflective listening to communicate understanding. Therapists should also adjust their approach based on the client's emotional and cognitive states, matching the client's tone and affect when appropriate. Support should be provided by creating an atmosphere of compassion, concern, and safety, validating the client's needs and experiences. Warmth can be conveyed through a friendly demeanour, appropriate smiling, touch, and casual interactions, with therapists expressing genuine liking, joy, and humour. Non-verbal communication includes consistent eye contact, open and engaged body language, facilitative utterances, and appropriate moments of silence. Therapists should also be mindful of the physical environment to ensure client comfort. Genuineness should be reflected in therapists incorporating their natural personality and authentic responses into the therapeutic relationship, possibly even disclosing personal experiences that may validate or instruct the client. Humility involves acknowledging flaws, areas of lacking knowledge, and mistakes and understanding that their worldview may differ from the client's. Therapists should apologise when appropriate. Hopefulness should be demonstrated through a genuine belief in humanity and the client's capacity for behaviour change, emphasising the strengths of others (Magill et al., 2024).

The findings also suggest that practitioner competence can be shown by being knowledgeable and skilful in the subject of the client's behaviour change, enacting duties skilfully, and promoting positive treatment expectations. Direction should be provided when therapists bring

their expertise to the relationship and offer advice when client resources are exhausted, waiting for a clear signal that advice is needed. Engagement can be shown by being reliable, timely, enthusiastic, and committed to the therapeutic relationship, completing agreed-upon duties promptly. Finally, flexibility involves being open to client feedback and adjusting the therapeutic approach as needed, demonstrating adaptability within sessions and throughout the treatment course. Overall, this study of the therapeutic relationship provides a thorough analysis and practical application of a crucial component within the behaviour change framework. The authors assert that the relationship constitutes a process in which therapists and healthcare professionals create the essential therapeutic setting for clients to make targeted behavioural modifications (Magill et al., 2024).

1.3 The Construct of Working Alliance in the Context of Physical Health

The construct of WA has gained attention within physical health research due to its relationship with treatment outcomes (Bernecker et al., 2013; Bishop et al., 2021; Burns & Evon, 2007; Diener & Monroe, 2011; Ferreira et al., 2013; Fuertes et al., 2017). For example, Bordin's conceptualisation with its three dimensions - goals, tasks, and bonds – has been applied to physiotherapy (Søndenå et al., 2020). While this conceptualisation serves as a foundational framework in the field, contemporary interpretations emphasise a higher degree of reciprocity, including SDM and collaborative efforts during goal setting and task assignment/implementation. Findings from a concept analysis of fourteen articles suggested that within physiotherapy, WA embodies profession-specific attributes such as the role of therapeutic touch and patient health-related beliefs (Søndenå et al., 2020). The authors explained that therapeutic touch could lay the foundation for establishing a physical and emotional connection, serving as a mechanism for legitimising patients' pain experiences. They described the importance of practitioners sharing the treatment journey with their patients, enabling them to become more independent. Patient-practitioner communication enables negotiation, facilitates knowledge transfer, and increases patients' understanding of their health. Once patients obtain greater awareness and control over their symptoms, the progression in treatment constitutes the subsequent change in patient behaviour (Søndenå et al., 2020).

The authors of a meta-ethnography synthesised seventeen qualitative peer-reviewed articles in the stroke rehabilitation literature (Lawton et al., 2016). Bordin's conceptualisation was applied to explore WA development and maintenance from the perspectives of both patients and practitioners. Four main themes were discussed: 1) the practitioner-patient relationship -

degree of connectedness; 2) asymmetrical contributions; 3) the collaboration process - finding the middle ground; and 4) system drivers. The findings emphasised the role of connectedness within therapeutic dyads. Trust was integral for collaboration, and practitioners often employed intentional actions to promote it, such as giving time, demonstrating empathy, using humour, and offering encouragement (Lawton et al., 2016). While the described patient experiences were mainly positive, some listed inhumane treatment, carelessness, insensitivity, and disregarding concerns as barriers to trust formation. Regarding goal setting, the process was viewed as primarily practitioner-led. The authors observed the presence of power imbalance and a tendency of practitioners to adopt the expert role. Patients assumed the role of a compliant recipient, expecting the experts to take responsibility for decision-making. Both patients and practitioners noted knowledge transfer as essential for setting agreed-upon goals, promoting patient engagement, and fostering mutual respect. Despite the willingness to engage patients in collaborative goal setting, practitioners shared doubts about knowing how to do so effectively. The identified barriers were organisational and financial factors, capable of hindering the patient-centred agenda underlying most healthcare policies (Lawton et al., 2016).

Scholars conducted a scoping review to explore WA in musculoskeletal rehabilitation in the physiotherapy and occupational therapy disciplines (Babatunde et al., 2017). They synthesised 130 articles, including quantitative, qualitative, and mixed methods studies, alongside reviews and discussions. The reported themes were congruence, connectedness, communication, expectation, influencing factors, individualised treatment, partnership, and roles and responsibilities. The most common aspect of congruence was the mutual agreement on goals. The concept of connectedness embodied friendliness and genuine interest or concern. Communication was characterised by clearly provided information, active listening, and nonverbal skills. The role of expectations was discussed in the context of the treatment process and outcomes. According to patients, practitioner-related factors impacting alliance strength were their competence, technical expertise, and interpersonal skills. Practitioners listed patients' life experiences and willingness to engage as the main patient-related factors. Individualised treatments were described as responsive and holistic. The partnership consisted of mutual understanding and active involvement. The responsibilities expected of a practitioner were maintaining professionalism, demonstrating competence, and offering support. The roles expected of a practitioner were that of a motivator, an encourager, an educator, an adviser, a guide, and an expert who facilitates access to resources and takes the initiative to monitor patient adherence (Babatunde et al., 2017).

The authors of a systematic review synthesised seven studies to identify factors influencing alliance strength and assess its impact on patient outcomes in musculoskeletal care (Kinney et al., 2020). While four of the seven included studies utilised Bordin's conceptualisation, three

incorporated related constructs such as rapport, collaboration, warmth, support, empathy, non-judgment, positive regard, and open communication. Four qualitative studies explored factors shaping alliance strength. The findings suggest that practitioners should keep the patient's best interest in mind, offer flexible treatment plans based on patient values and potential barriers, and address issues in the relationship. Three quantitative studies evaluated the impact of the alliance, illustrating its association with pain intensity in patients receiving physiotherapy. The authors suggested that when combined with conventional physiotherapy interventions, a strong WA can be more effective in addressing chronic musculoskeletal pain than interventions alone (Kinney et al., 2020).

A retrospective observational study nested within a randomised controlled trial involved 182 patients with chronic LBP who underwent different treatment modalities such as general exercises, motor control exercises, and spinal manipulative therapy (Ferreira et al., 2013). The research aimed to explore the impact of the patient-physiotherapist alliance measured at the end of the second treatment session. The results found that the early alliance consistently predicted patient outcomes across various measures, including physical function, global perceived effect of treatment, pain, and disability. For instance, a one-unit increase in alliance strength was associated with a pain reduction of 0.044 units, 95% CI [-0.070, -0.017], implying a stronger alliance was associated with a modest decrease in pain. The alliance-outcome association was slightly more robust for the final scores of global perceived effect when participants received general exercises or spinal manipulative therapy than motor control exercises. The study highlights the importance of positive WA between patients and physiotherapists in predicting clinical outcomes for chronic LBP (Ferreira et al., 2013).

A prospective observational study in a private outpatient clinic examined the alliance-outcome relationship in physiotherapy (Holmes et al., 2023). Fifty patients participated, presenting with acute and chronic musculoskeletal pain affecting the upper extremity, lower extremity, neck, and lumbar/thoracic body regions. The WA, including the bond, goal, and task dimensions, was assessed before the third treatment session to allow an opportunity for the relationship to develop while minimising the impact of other interventions. Patient-reported outcome measures (PROMs) were used to explore the effect of a patient's condition on disability. A subjective numeric pain rating scale measured patient perceptions of pain intensity. At the end of care, the authors dichotomised patients into groups based on their outcomes using the minimal clinically important difference. The results found statistically significant correlations between patients' ratings of WA and the two dependent variables - disability ($r = 0.365$, $p = 0.009$) and pain intensity ($r = -.316$, $p = 0.025$). Patients with higher WA ratings were more likely to meet the minimal clinically important difference for disability and pain. The authors conducted two stepwise multivariable regressions to explore further the role of alliance ratings

and the amount of care provided. Findings revealed that patient alliance ratings and the length of an episode of care predicted condition-related disability, explaining approximately 22.4% of the variability in improvement. Interestingly, only patient WA ratings predicted improvement in pain intensity, explaining about 10% of the variability. The authors reported that the patients who rated WA higher after two sessions were more likely to make a meaningful improvement during their course of physiotherapy (Holmes et al., 2023).

A prospective cohort study measured the effects of contextual components, i.e., non-specific factors, on patient outcomes across physiotherapy, osteopathy, and acupuncture clinics in the UK (Bishop et al., 2021). The primary outcome was back-related disability measured by the Roland Morris Disability Questionnaire (Roland & Morris, 1983a). The authors collected data via patient-reported and practitioner-reported questionnaires at three time points from 166 practitioners and 960 adult patients receiving treatment for LBP. They explored the impact of WA, patients' beliefs, practitioners' beliefs, and the healthcare environment. The findings revealed that stronger WA on all three dimensions was a statistically significant predictor of reduced back-related disability over time. WA demonstrated the largest effect size for the task dimension: for each unit increase in patients' ratings, back-related disability over time decreased by 2.33 points, 95% CI [−2.89, −1.77]. There were no significant interactions between the predictors and the type of treatment, indicating the potential generic nature of contextual effects across the three professions, i.e., osteopathy, acupuncture, and physiotherapy. The study concluded that enhancing contextual components in musculoskeletal care can improve patient outcomes. The authors recommend that interventions focus on building positive patient-practitioner WA, emphasising strong affective bonds and agreements on treatment goals and tasks (Bishop et al., 2021).

Patient-reported measures, like the ones utilised in studies exploring the impact of WA, provide a comprehensive assessment crucial for patient-centred care research. However, such measures may be subject to participant bias or interpretation differences (Dowling et al., 2016). For example, self-report measures are sensitive to response style effects, e.g., an extreme response style, where respondents tend to select the extremes of a rating scale, thus potentially affecting the validity of assessments (Dowling et al., 2016). Most research examining the alliance-outcome relationship is observational, such as cohort or cross-sectional studies. These studies provide valuable evidence of this relationship but do not establish a causal link (Bzovsky et al., 2022; Janse et al., 2021). The relationship between two variables does not imply causation, as underlying factors or omitted variables may influence the observed findings (Rohrer, 2018). Omitted variable bias, outliers, and small sample sizes can result in biased estimates and low statistical power (Rohrer, 2018). Replicating results across different samples and clinical settings can enhance research evidence, mitigating issues related to ecological

validity, that is, the extent to which study findings can be generalised to different contexts (Koopmans & Schiller, 2022).

1.4 Chiropractic Care

In a scoping review, 328 articles reporting the utilisation rates, reasons for seeking care, patient profiles, and care provided in the chiropractic profession were synthesised (Beliveau et al., 2017). Most studies were carried out in the following countries: US (n = 183), Canada (n = 47), Australia (n = 41), UK (n = 17), and Denmark (n = 13). The findings suggest that globally, the median 12-month utilisation of services was 9%. Most patients were female (57%), employed (77%), with a median age of 43.4 years, seeking chiropractic care for predominantly low back (50%) and neck pain (23%). Chiropractors most commonly provided manipulation (79%), soft-tissue therapy (35%), and formal patient education (31%) (Beliveau et al., 2017). More recently, a scoping literature review of 69 articles addressed the disparities in chiropractic utilisation across different demographic groups, exploring the rates by race, ethnicity, and socioeconomic status (Gliedt et al., 2023). While the data were primarily collected in the US, the results found that utilisation rates were highest for individuals identifying as European American/White/non-Hispanic White/Caucasian (20%), with less than or equal to (12 years) of high school diploma/general educational development certificate completion (31%), reporting employment as a leading source of income (79%) (Gliedt et al., 2023).

The field of chiropractic emerged in the late 1800s as an alternative approach to health and disease compared to conventional medicine (Moore, 1995). The profession has undergone notable changes, characterised by the contributions of key individuals and distinct periods of advancement. Daniel David Palmer and his son Bartlett Joshua Palmer played crucial roles in forming chiropractic concepts and theories during the early years (1895-1925) (Sportelli, 2019). D. D. Palmer, who initially practised magnetic healing, was particularly interested in the human anatomy. He argued that minor spinal misalignments, known as *"subluxations,"* could affect the nervous system and regulate human organ systems (Palmer, 1958). His theory relied on vitalistic concepts that imply living beings are supported by unexplainable non-physical vital energy. In 1897, he combined his knowledge of magnetic healing with manual manipulation, establishing the groundwork for the chiropractic profession (Sportelli, 2019). In 1906, he passed the torch to his son B. J. Palmer, who further developed chiropractic into a recognised healing art and profession (Moore, 1995). From 1925 to 1950, the period witnessed increased public acknowledgement of chiropractic, resulting in the founding of numerous chiropractic schools and advocacy for enhanced education and licensure (Sportelli, 2019). Despite gaining greater public awareness and acceptance during the 1960s and 1970s, chiropractic encountered

opposition from the AMA (Sportelli, 2019). This led to a legal dispute, which concluded favouring the chiropractic plaintiffs, finding that the AMA had unfairly targeted the chiropractic profession. In the subsequent years, chiropractic made progress, with colleges evolving into modern educational institutions and the profession gaining recognition through accreditation (Sportelli, 2019). Today, chiropractic is widely acknowledged and accepted, with increasing utilisation for musculoskeletal disorders. Despite enduring negative perceptions, the profession has thrived due to its clinical effectiveness and patient satisfaction (Sportelli, 2019).

The concept of vitalism has evolved over time, resulting in various types, such as animistic, somatic, and naturalised (Simpson & Young, 2020). For instance, animistic vitalists believe in a supernatural vital force, while somatic vitalists argue that the vital force originated from within the organism itself (Nicholson, 2010). On the other hand, naturalised vitalists perceive the vital force as a heuristic device, serving as a placeholder for unknown biological processes that science would eventually explain (Coulter et al., 2019). Throughout its variations, vitalism has consistently highlighted the uniqueness of life and the presence of an irreducible vital principle in living beings. However, vitalism has been criticised for its lack of empirical evidence and its dependence on supernatural explanations (Simpson & Young, 2020). In response, mechanistic and physicalist approaches have emerged, aiming to explain biological phenomena through physiochemical laws and principles (Simpson & Young, 2020).

While most researchers have prioritised assessing the impact of biomechanical and neurophysiological mechanisms, others argue that the interplay between them should be better understood in the context of chiropractic care (Bialosky et al., 2009). Evidence suggests that contextual effects, often referred to as *"nonspecific"* or *"placebo"* effects, can impact pain modulation, immune responses, and motor function through psychological and neurophysiological mechanisms (Colloca et al., 2013; Emadi Andani et al., 2015; Hadamitzky et al., 2018). Nonetheless, "*nonspecific"* effects have received less research attention than *"specific"* treatment effects. Scholars have challenged this dichotomy, suggesting that the nonspecific effects are real, measurable, clinically relevant, and biologically specific (Newell et al., 2017; Noakes, 2011; Testa & Rossettini, 2016). For instance, the neural pathways underlying context-induced pain relief resemble those activated by opioids (Petrovic et al., 2002). Contextual factors such as patient-practitioner alliance have been emphasised in relation to treatment outcomes (Newell et al., 2017; Testa & Rossettini, 2016). Additionally, scientific theories have been developed to account for the brain's capacity to evaluate clinical context, predict future outcomes, and modulate physiological processes through psychological mechanisms (Newell et al., 2017; Noakes, 2011; Testa & Rossettini, 2016). Insights from research exploring psychological mechanisms can enable practitioners to utilise contextual effects and maximise treatment outcomes.

In early 2017, a survey was conducted among European chiropractors, reaching approximately 17.2% of the chiropractic profession in Europe (Gíslason et al., 2019). A total of 1 322 responses were collected. The survey grouped chiropractic identities into two categories: orthodox and unorthodox paradigms. The orthodox paradigm encompasses musculoskeletal, neurophysiological, and preventive/wellness-focused explanations. On the other hand, the unorthodox paradigm is rooted in vitalism and emphasises the body's innate ability to self-heal. It often incorporates less empirically supported ideas, such as subluxations, alongside evidence-based concepts like healthy eating and physical activity. The findings revealed that 20.1% of respondents held unorthodox views, while 79.9% held orthodox beliefs. The authors identified the male gender, seeing more than 150 patients per week, not conducting routine differential diagnosis, and strongly opposing the positive impact of vaccines on health as highly predictive of unorthodox categorisation using logistic regression models. These results suggest that certain practice characteristics, such as non-compliance with national radiation guidelines and opposition to evidence-based public health policy, are significantly associated with unorthodox chiropractic paradigms (Gíslason et al., 2019).

A study conducted in Australia and Canada explored the therapeutic interventions that chiropractors chose for different diagnostic presentations (Jenkins et al., 2023). Results from more than 10,000 chiropractic clinical encounters suggest that manipulation and soft tissue techniques were the most utilised interventions (Jenkins et al., 2023). However, the choice of intervention was shaped by the interplay between evidence-based practices, practitioners' experience, and patients' characteristics. For instance, manipulation was less likely to be selected if patients were female, older, new to the provider, had comorbidities, or were underweight or obese (Jenkins et al., 2023). Despite being recommended by clinical practice guidelines, providing advice, education, and exercise was the less frequent choice of intervention. Chiropractors with less experience were more likely to offer advice, education, and exercises than more seasoned practitioners. The authors implied that such differences reflect the change in curriculum content and emphasised the need for strategies promoting adherence to guidelines (Jenkins et al., 2023).

As primary healthcare professionals, chiropractors can provide preventative and promotional healthcare to patients. Fikar and colleagues (2015) explored to what extent such care is provided in the UK (Fikar et al., 2015). The study involved distributing a cross-sectional online questionnaire to four chiropractic associations. Descriptive analyses were conducted to identify current practice trends among chiropractors. The results indicated that most chiropractors engage in evaluating and monitoring patients' posture (97.1%), inactivity/overactivity (90.8%), and movement patterns (88.6%). A slightly lower percentage provides care for psychosocial stress (82.3%), nutrition (74.1%), and disturbed sleep (72.9%).

Verbal advice was reported as the most successful resource in encouraging positive lifestyle changes by 68.8% of respondents. Most respondents (70.7% to 80.4%) utilise goal setting for physical fitness issues, while approximately two-fifths (41.7%) or less use goal setting for other lifestyle issues. The results suggest that UK chiropractors actively promote positive lifestyle changes related to preventative healthcare and health promotion. However, there is room for improvement, particularly in addressing smoking and over-consumption of alcohol. The authors noted that broader implementation of goal setting to support patient-provider relationships could increase the utility of valuable advice and resources (Fikar et al., 2015).

A study was conducted between 2013 and 2018 to analyse the responses of chiropractic students from Europe, North America, and Australia/New Zealand regarding their views on chiropractic identity, role, setting, and future direction (Swain et al., 2021). The study included data from 2396 student chiropractors and found conflicting responses among the students, particularly regarding traditional versus contemporary chiropractic principles. The analysis revealed that half of the students demonstrated conflicting attitudes, potentially impacting their ability to learn and make clinical judgments. Factors such as professional association membership status and pre-chiropractic education were also associated with ideologically conflicting responses. The geographical region was identified as a significant factor influencing cognitive dissonance, with European students displaying the most diverse frequency of conflicting perceptions. The authors suggest that educational institutions should develop consistent curricula that can be integrated across international chiropractic programs and aligned with other health disciplines (Swain et al., 2021).

A study compared data from MCC with data from another UK chiropractic university, AECC University College, to investigate the determinants influencing students' decisions to pursue chiropractic education (Yalden et al., 2013). The authors found that most students at MCC held General Certificates of Secondary Education (82.6%) and Advanced School Certificates (54.5%). The primary reasons for studying chiropractic were to help others (54.5%) and interest in chiropractic's holistic, drug-free approach to health (44.6%). The results also indicated a predominantly female student population (62.0%), with the majority falling into the "older matures" category (25+ years old). Conclusions drawn from the study highlighted the importance of previous experiences with chiropractic care as a driving factor for pursuing chiropractic education. Additionally, the findings identified the significance of the ability to work while studying for many students. The authors discussed several limitations, including using a customised questionnaire, reliance on student recollections, and limited generalisability to all UK chiropractic students. To address these limitations, future research should aim to encompass a broader sample by including students from multiple UK chiropractic colleges. Electronic surveys may also improve response rates (Yalden et al., 2013).

GCC is the regulatory body overseeing the profession in the UK (GCC, 2016). The title of 'chiropractor' is protected by law (GCC, 1994). To practice as a chiropractor in the UK, individuals must complete an approved chiropractic degree and register with the GCC. Five educational establishments in the UK offer approved degree courses in chiropractic, typically lasting four years at degree level. Students must meet learning outcome standards in chiropractic care, patient health needs assessment, evidence-based care application, evaluation of scientific research methods in clinical practice, effective communication with the public, patients, and healthcare professionals, and understanding professional accountability during their studies (GCC, 2024b). The responsibilities and procedures of the GCC ensure standards within the field through the establishment of clinical guidelines outlined in the Code of Practice (GCC, 2016). Should these standards be disregarded and a chiropractor be deemed unfit to practice following an official investigation, the GCC has the authority to expel them from its Register.

Chiropractic care in the UK is considered a form of CAM, with approximately 3,500 chiropractors in private practice (GCC, 2024a). They are qualified healthcare professionals who assess, diagnose, and address various musculoskeletal conditions. Chiropractors are trained in various techniques, primarily manual care methods such as spinal and joint manipulation, as well as other hands-on or instrument-assisted approaches. They also provide lifestyle advice and exercises to manage patient conditions, including dietary and nutritional guidance and stress management strategies (GCC, 2024a). A national survey of 4862 adults was conducted in 2018 to obtain up-to-date general population figures for CAM utilisation in England (Sharp et al., 2018). The results found that 16% of participants had seen a CAM practitioner in the previous 12 months for predominantly musculoskeletal conditions (68%) (Sharp et al., 2018). While 67% of CAM use was self-referred and self-funded, 13% was financed by the NHS. CAM users were more likely to be female, have higher socioeconomic status, and live in southern England (Sharp et al., 2018).

A common reason for turning to CAM was patients' dissatisfaction with mainstream healthcare due to ineffectiveness or side effects (Tangkiatkumjai et al., 2020). Patient-led demand for holistic care is the main organisational driver for integrating CAM with publicly funded mainstream healthcare (Sharp et al., 2018). Evidence supports the effectiveness of manual therapy for musculoskeletal conditions, but the proof of non-musculoskeletal conditions is considered mostly inconclusive (Clar et al., 2014). A study compared the clinical outcomes of 8222 patients receiving chiropractic care via either self-referred (59%) or NHS-referred routes (41%) (Field & Newell, 2016). At baseline, 47% of the self-referred patients and 55% of NHS patients had experienced pain for at least one month a year. Similarly, the self-referred group reported a lower percentage of pain recurrence (64%) than the NHS group (76%). Regardless,

most patients achieved clinically important changes over 90 days, and both groups experienced improvements across a range of patient-reported outcome measures (Field & Newell, 2016).

There is an urgent need for research on the psychological aspects of CAM, particularly the alliance, due to the potential theoretical and practical implications (Sherriff et al., 2023). Manual therapies, such as chiropractic care, are the most sought-after CAM treatments (Sharp et al., 2018). CAM practitioners often allocate more time to individual patients than other healthcare providers. The time spent with patients usually allows for establishing stronger alliances. The current thesis explores the chiropractor-patient alliance because the construct has not been studied extensively. The primary research examines the complex alliance dynamics between patients and trainee chiropractors. This comprehensive investigation is expected to provide valuable insights for evidence-based practice and to inform training programs focusing on the patient-practitioner relationship. Trainee chiropractors typically spend even more time with patients, including during the initial assessment phase, than qualified practitioners. This early engagement presents a unique opportunity to establish a therapeutic relationship at the onset of the patient's care journey, offering valuable insights into the initial development and subsequent progression of patient-trainee chiropractor alliances. Additionally, the affordability of services at a teaching clinic enables an investigation of alliances within a broader and more diverse patient population context.

1.5 Theoretical Frameworks and Research Gaps

1.5.1 The Biopsychosocial Model and Patient-Centred Care

Over the past half-century, there has been a paradigm shift towards the biopsychosocial model of healthcare that guides clinical research and practice (Smith, 2002). Challenging the reductionist biomedical model, the biopsychosocial model implies that patient care should extend beyond the focus on physiology, encouraging a more holistic understanding of health and disease (Engel, 1980). This paradigm shift broadens the scope of clinical practice to include social and psychological factors, emphasising the role of help-seeking behaviours and the value of health promotion. While the biopsychosocial model offers a comprehensive view of the patient’s illness, it cannot fully grasp the patient’s experience (Mead & Bower, 2000). As a result, the patient-centred approach has gained prominence (Balint, 1969; Søndenå et al., 2020). Mead and Bower (2000) outline the differences between the biomedical and patient-centred approaches to consultations in terms of five dimensions: 1) adopting a biopsychosocial perspective, 2) understanding the patient’s experience of illness, 3) sharing power and

responsibility, 4) establishing a patient-practitioner alliance, and 5) considering the influence of the practitioner's personal qualities (Mead & Bower, 2000).

The biomedical model emphasises decision-making and procedural issues for diagnosis and treatment but still recognises the significance of a positive patient-practitioner relationship in increasing treatment adherence (Mead & Bower, 2000). The patient-centred approach puts even greater emphasis, implying that a strong alliance has the potential to provide therapeutic benefits in itself (Mead & Bower, 2000). Despite evidence supporting its impact on clinical outcomes, the alliance is often overlooked in treatment manuals and training programs (Ferreira et al., 2013; Fuentes et al., 2014; Hall et al., 2010). Its current conceptualisation, which is mostly rooted in psychotherapy, should be modified to become more applicable to various interventions beyond the field of psychology (Babatunde et al., 2017). Scholars suggest that further theory development in the context of musculoskeletal care can inform clinical practice, helping practitioners build positive relationships and provide patient-centred care (Jamison, 1996; Newell et al., 2017; Søndenå et al., 2020).

Practitioners often face challenges balancing their ethical responsibility to nurture therapeutic relationships with time constraints and organisational pressures within the healthcare system (Moecke & Camp, 2024). A systematic literature review of eighty articles aimed to devise an updated definition of patient-centredness (Langberg et al., 2019). The identified dimensions were categorised into three elements to inform clinical practice. The elements were 1) understanding the patient's experience, 2) the patient-practitioner relationship, and 3) care coordination within the healthcare system. While a new dimension, coordinated care, has emerged in more recent studies, the authors concluded that Mead and Bower's conceptualisation remains relevant to both theory and clinical practice (Langberg et al., 2019; Mead & Bower, 2000). They also explained that the new dimension reflects the increasing complexity of the healthcare system, highlighting the need to integrate different aspects of care for a seamless patient experience (Langberg et al., 2019). Among the dimensions, the alliance was identified as the second most important factor and was discussed in 63 articles. With a strong focus on establishing positive alliances, in this dimension, scholars proposed relationship-centredness as a more comprehensive approach to patient-centeredness (Langberg et al., 2019).

Relationship-centred care prioritises a system perspective that considers all interdependent relationships, outlining four dimensions that professionals should address in the services they provide: 1) the relationship with the patient, 2) the relationships with other providers, 3) the relationships with the community, and 4) the professional's relationship with themselves (Beach et al., 2006). Scholars propose that relationship- and patient-centred care complement

each other and operate in unison (Nundy & Oswald, 2014). Their interdependence is crucial for innovation in population health management (Nundy & Oswald, 2014). In the patient-practitioner relationship, the patient's needs, emotions, and personal agenda should be fully acknowledged and negotiated. At the same time, the practitioner also attends to their own needs, emotions, and clinical agenda (Hirschmann & Schlair, 2020). The negotiation process also occurs across team members, leadership, the clinical institution, and the healthcare system (Hirschmann & Schlair, 2020). It extends to the community, including family and peer patient support and community health resources (Nundy & Oswald, 2014). However, practitioners often face challenges balancing their ethical responsibility to nurture therapeutic relationships with time constraints and organisational pressures within the healthcare system.

The field of physical rehabilitation aims to enhance individuals' functioning and minimise disability resulting from health conditions (Mills et al., 2017). Interventions may involve a single practitioner or a multidisciplinary team comprising physical therapists, occupational therapists, psychologists, chiropractors, speech pathologists, and recreation therapists (Hall et al., 2010). Salsbury and colleagues (2018) conducted a qualitative analysis as part of a multi-phase organisational case study to assess the planned integration of a chiropractor into a multidisciplinary rehabilitation team (Salsbury et al., 2018). Data collection involved semi-structured interviews and focus groups, which were audio-recorded. The transcripts were analysed using thematic content analysis. A total of 60 participants were interviewed, including 48 staff members, 6 patients, 4 family members, and 2 community members. The results underscored specific attributes that chiropractors could develop to improve patient outcomes, enhance the healthcare experience, influence clinical decision-making and interprofessional teamwork, and impact healthcare organisations.

The analysis produced a conceptual model of The Preferred Chiropractor for Multidisciplinary Rehabilitation Settings comprising 5 domains and 13 themes. The main domain, Patient-Centeredness, was a recurring theme linked to all other domains. The Professional Qualities domain emphasised clinical acumen, efficacious treatment, and safety as key attributes. Interpersonal Qualities encouraged chiropractors to demonstrate comforting patience, foster connections, and exhibit emotional intelligence. Participants recommended a gentle and patient-centred approach during chiropractic visits, underscoring the importance of emotional intelligence in the chiropractor's interactions with patients. The study also highlighted the significance of interprofessional qualities, such as teamwork, resourcefulness, and openness to feedback, in enhancing the chiropractor's ability to work within an interdisciplinary setting. Organisational qualities were identified as essential attributes, including personality fit, institutional compliance, and mission alignment. The findings offer valuable insights into how chiropractors can contribute to multidisciplinary healthcare settings (Salsbury et al., 2018).

A systematic review of 14 qualitative studies was conducted to synthesise themes related to patient-centeredness in physiotherapy from the perspectives of patients and physiotherapists (Wijma et al., 2017). The authors generated eight primary descriptive themes and four subthemes. The themes comprise individuality (with subthemes *"Getting to know the patient"* and *"Individualised treatment"*), education, communication (including the subtheme *"Non-verbal communication"*), goal setting, support (with the subtheme *"Empowerment"*), the social characteristics of a patient-centred physiotherapist, a confident physiotherapist, and the knowledge and skills of a patient-centred physiotherapist. The findings suggest that support from the physiotherapist involves individualised care, shared responsibility, empathy, reassurance, and empowerment, which patients highly value. Patient-centred physiotherapists practice active listening and use non-verbal communication techniques to demonstrate respect, empathy, and caring, helping create a supportive and comfortable environment for patients, allowing space for emotions, and exhibiting respect and consideration. Non-verbal communication strategies include maintaining eye contact, nodding, and facial expressions. Understanding the patient involves a comprehensive assessment of their history, needs, preferences, personality, beliefs, values, expectations, motivation, and circumstances. Individualised treatment includes a personalised plan, tailored exercises, advice, and education developed through SDM and collaboration. Patient education is a crucial aspect of patient-centred care, encompassing the explanation of physical symptoms, problems, diagnosis, and treatment. The educational content must be relevant, focused on the patient's issues, and aligned with their perceptions and understanding. Utilising visual aids, metaphors, and demonstrations can enhance patient education. Goal setting engages and motivates patients, establishes meaningful therapy goals, and determines discharge criteria. Patient-centred physiotherapists assist patients in defining their own goals through collaboration, providing guidance and education (Wijma et al., 2017).

Researchers explored patient expectations and preferences regarding physiotherapy treatment (Bernhardsson et al., 2017). The study adopted an explorative qualitative design with an inductive approach. Semi-structured interviews were carried out with 20 individuals seeking physiotherapy. The interviews were recorded, transcribed, and subjected to qualitative content analysis. The findings suggest that participants anticipated a clear explanation of their condition and a well-defined treatment plan. Those participants who did not have specific treatment preferences placed particular trust in the physiotherapist's professional competence and decision-making abilities. It was observed that participants' treatment preferences were affected by their previous personal and social experiences. Positive past experiences with specific treatments led to elevated expectations, while negative experiences, particularly with examination and follow-up, resulted in diminished expectations. External influences, such as

others' experiences and media, also played a crucial role in shaping the participants' perceptions and treatment preferences. Acupuncture was valued for its pain reduction and tension relief with minimal effort, while soft tissue massage was preferred for its pleasant sensations and ease of application. Most patients favoured a combination of interventions, including exercise and self-management advice. Exercise was preferred for its active involvement and perceived effectiveness, while self-management advice was desired to empower participants to have more control over their treatment and prevent recurrence (Bernhardsson et al., 2017).

The traditional paternalistic model of the doctor-patient relationship involves the physician making treatment decisions based on their expertise and then seeking the patient's consent (Kaba & Sooriakumaran, 2007). However, this approach has been criticised, and there is a call for a more patient-centred, participatory approach (Dumez & Pomey, 2019). This approach emphasises understanding the patient's perspective and viewing illness through the patient's eyes. There is a need for further research to determine the most effective approach in different contexts (Fernández-Ballesteros et al., 2019). It is important to adapt the level of patient protection based on personal abilities and needs to prevent excessive overprotection while promoting autonomy tailored to each individual's capacity. Placing excessive emphasis on autonomy can result in increased anxiety and distress, surpassing the person's ability to cope (Fernández-Ballesteros et al., 2019).

Stuber and colleagues (2018) conducted a study to examine how patients with chronic health conditions perceive chiropractic care to be patient-centred (Stuber et al., 2018). The study employed a mixed methods approach, using a questionnaire survey and semi-structured interviews. The questionnaire was based on the PACIC instrument, which evaluates patient-centred care for chronic conditions. A total of 78 patients completed the questionnaire, and 41 also participated in semi-structured interviews. The interviews were transcribed verbatim and analysed using thematic analysis. The study found that the average overall PACIC score was 3.29 on a 5-point scale, with higher scores indicating more patient-centred care. The *"problem solving/contextual"* subscale received the highest average score, followed closely by *"patient activation."* These findings were supported by interview data, suggesting that the chiropractic approach to managing chronic pain emphasises holistic and reflective care, focusing on problem-solving and active involvement while considering various internal and external factors that could impact chronic conditions. However, despite higher scores in the *"patient activation"* subscale, indicating the presence of patient involvement in treatment choice and planning, interviewees revealed that patient involvement in clinical decisions and goal setting was limited. The lowest average PACIC subscale scores were on the *"goal setting/tailoring"* and *"follow-*

up/coordination" subscales. The study provides initial insights into patient-centeredness in chiropractic care for chronic health conditions (Stuber et al., 2018).

SDM is integral to patient-centred care. It enables clinicians and patients to collaborate throughout the treatment process and integrate the best available scientific evidence with patients' values and preferences for managing their health problems (Moore & Kaplan, 2018). Scholars conducted a systematic literature review to explore SDM models, resulting in 40 included articles, with 34 different first authors, each describing a unique model (Bomhof-Roordink et al., 2019). Out of these, 12 SDM models were found to be generic, while the rest were designed for specific healthcare settings or patient groups. The most prevalent component in the models was *"Describing treatment options,"* which was included in 35 out of 40 models (88%). Most models imply that the patient and the practitioner must agree on the final decision. The practitioner was often identified as the sole actor within components, meaning they are seen as responsible for the SDM process. In over half of the models, the practitioner was held accountable for the following components: Support decision-making process (92%), Advocate patient views (69%), Prepare (67%), Learn about the patient (64%), Describe treatment options (63%), Offer time (63%), Provide neutral information (63%), Provide recommendation (60%), Healthcare professional preferences (57%), Create choice awareness (55%), and Tailor information (54%). Both practitioners and patients were identified in Reach mutual agreement (57%), whereas no actor was identified in Healthcare professional expertise (100%), Patient expertise (67%), and Gather support and information (56%). Overall, the review highlighted both commonalities and significant heterogeneity across SDM models, indicating the complexity and diversity within the field (Bomhof-Roordink et al., 2019).

SDM, mutual agreement, and collaboration on the goals of care are integral to the patient-practitioner alliance. A study aimed to develop conceptual descriptions of goal-oriented care by examining the perspectives of general practitioners (GPs) and clinical geriatricians (CGs), particularly in relation to collaborative communication and SDM with elderly patients with multimorbidity (Vermunt et al., 2018). Qualitative interviews were conducted with GPs and CGs, and analysed via inductive thematic analysis. Clinicians identified three types of goals: disease- or symptom-specific, functional, and fundamental. Disease-specific or symptom-specific goals are related to addressing particular medical conditions or symptoms. Functional goals are related to reducing limitations in functioning, while fundamental goals reflect a patient's broad sense of their future. There were three orientation categories for practitioners' consideration of fundamental goals: no consideration, implicit consideration, and explicit consideration. It is important for practitioners to explicitly consider fundamental goals in decision-making, as patients' preferences may not always align with medical standards or practitioners' preferences. Explicit consideration of fundamental goals can help clarify patients' values and

priorities. To effectively navigate patient care, it is essential to have a comprehensive understanding of the three levels of goals and their interconnected nature. Prioritising a particular type of goal in a given care scenario depends on patient-specific, professional-specific, and contextual factors (Vermunt et al., 2018).

Early models of SDM did not initially incorporate goal setting as a specific component, which is particularly important for patients with long-term conditions and complex health issues (Elwyn & Vermunt, 2020). To address this gap, a new goal-based SDM model has been proposed, which integrates goal setting at the three distinct levels (symptom-specific, functional, and fundamental) into the three-talk SDM model (Elwyn & Vermunt, 2020). The model consists of three crucial steps: goal-team talk, goal-option talk, and goal-decision talk. The main objective is to enable person-centred decision-making by identifying and prioritising goals as well as aligning these goals with interventions. During the goal-team talk, the clinician engages the patient in a discussion about their goals, summarises the issues, and outlines the risks and benefits of each option. The patient's aspirations and concerns are discussed, and their goals are summarised and prioritised. The clinician offers support and guidance to help the patient achieve these goals. In the goal-option talk, the clinician and patient consider the collective and conflicting aspects of interventions in relation to goal achievement. They discuss the potential impact of each intervention on multiple goals and prioritise the options. Visualisation techniques, such as a Goal Board, can be used to display prioritised goals and facilitate discussion on the potential positive and negative impacts of interventions on more than one goal. Finally, during the goal-decision talk, the clinician and patient work together to clarify the next steps, determine responsibilities, and agree on how and when to evaluate the outcomes. They discuss the potential consequences of each option and agree on the decisions to be made. The clinician's role is supportive, using motivational interviewing skills when behaviour change is necessary and employing SDM when comparing options. Further evaluation is necessary to determine the merit and effectiveness of this integrated approach (Elwyn & Vermunt, 2020).

1.5.2 Patient-Practitioner Communication

The communication model underlying each clinical encounter encompasses implicit presumptions about roles and responsibilities, power dynamics, and the nature of the patient-practitioner relationship (Kaba & Sooriakumaran, 2007). The most predominant are practitioner- and patient-centred communication models (Smith & Hoppe, 1991). The practitioner-centred model aligns with the biomedical model of care, focusing on biological causes and explanations. On the other hand, the patient-centred model prioritises information gathering

and customising treatment based on the unique needs and viewpoints of the individual patient, integrating the biological, social, and psychological aspects of the patient's condition.

Researchers explored practitioner-patient communication in a physical health context using a modified Delphi approach, analysing data from 73 randomised controlled trials and controlled observational studies (Drossman et al., 2021). Their review addressed the following objectives: 1) conducting an evidence-based review to explore the impact of communication skills on patient satisfaction and treatment outcomes; 2) assessing the measurement and consequences of communication skills training on these outcomes; 3) identifying the influence of sociocultural factors, healthcare system limitations, patient perspectives, and telehealth on the patient-practitioner relationship; and 4) providing recommendations to enhance communication skills training. The findings suggest that practitioners' effective communication skills can reduce costs and improve therapeutic relationships and patient health outcomes. Still, comprehensive training and systemic changes will be necessary to achieve this.

The authors argue that while longer visits are linked to higher patient satisfaction, the critical factor is the patient-centred nature of the visit rather than its duration (Drossman et al., 2021). Patient perceptions can be shaped by their expectations, perceived visit duration, communication quality, practitioner's empathy level, and the amount of patient education. It is important to note that patients experience symptoms rather than just diagnoses, and many seek healthcare for unexplained symptoms. The dualistic model of care, which treats the mind and body as separate entities, prioritises structural diagnoses over *"functional"* ones. This approach can lead to the stigmatisation of patients with unexplained symptoms. It may erode patient confidence and the therapeutic relationship when negative test results are communicated, or hesitant diagnostic language is used. Patients who perceive their illness in a dualistic way may develop feelings of guilt and self-blame, as their condition is not perceived as *"real"*. This sense of isolation and stigma adds to the stress patients experience as they manage their symptoms. Allowing patients to articulate their narratives in a supportive environment where they feel heard can provide valuable insights into their illness experiences, leading to a sense of hope. Conversely, suppressing patients' narratives can result in feelings of hopelessness and frustration.

It was also suggested that practitioners adhering to this model may encounter challenges in explaining diagnosis and management, particularly for conditions lacking clear structural explanations, such as non-specific LBP (Drossman et al., 2021). The authors argue that clinician scepticism or frustration can create new disease labels that do not necessarily contribute to patient-centred care. Some patients may adhere to acute illness explanatory models and expect immediate relief, leading to a high *"doctor shopping"* rate and emergency department

visits. Practitioners must effectively manage these elevated expectations by acknowledging the patient's frustration and communicating shared responsibility for care. Ultimately, aligning the patient's explanatory model of illness with the practitioner's knowledge is crucial in addressing unexplained symptoms and chronic conditions that do not neatly fit into clear diagnostic categories. Encouraging patients to describe the impact of illness on their daily lives can make them feel valued and more likely to consider the practitioner as an empathetic partner, leading to increased trust, treatment adherence, and care effectiveness (Drossman et al., 2021).

In such situations where the cause and prognosis of a condition are uncertain, practitioners can employ affective reassurance strategies, such as building rapport and displaying empathy, and cognitive reassurance strategies, such as providing explanations and education (Pincus et al., 2013). Pincus and colleagues (2013) conducted a systematic literature review, including evidence from prospective cohorts in primary care, exploring the influence of both types of reassurance on patient outcomes (Pincus et al., 2013). They defined reassuring behaviour as actions carried out by the practitioner that tend to lead to changes in the patient's behaviour, understanding, or thoughts. Effective reassurance was evaluated through patient-reported changes in beliefs and mood and measures of improved coping and problem management. Sixteen studies meeting the entry criteria were analysed. The findings suggest that the impact of affective reassurance on patient outcomes is mixed, with some studies showing higher satisfaction and enablement while others report lower satisfaction and increased concerns. Affective reassurance is also associated with increased symptom burden, less improvement, and reduced adherence. Conversely, cognitive reassurance is linked to higher satisfaction, symptom improvement at follow-up, and reduced healthcare utilisation. However, its relationship with adherence is not clearly established. The authors emphasised the role of reassurance in supporting patients in managing their condition, especially in non-specific pain conditions. This includes clarifying prognosis, ruling out serious diseases, and discussing treatment plans. The findings illustrate the value of patient education, a crucial aspect of patient-centred care (Pincus et al., 2013).

Pinto and colleagues (2012) conducted a systematic review to explore the association between communication factors and alliance strength during practitioner-patient encounters (Pinto et al., 2012). Various measures of association were employed across twelve studies, including correlation coefficients, relative risks, odds ratio, and parameters from multivariate analysis. The results found a total of 67 communication factors, with 36 interaction styles, 17 verbal and 14 non-verbal factors. Of the 36 interaction styles, 20 were categorised as both patient facilitating and patient involving, seven as patient supporting, and nine as patient education. The analysis revealed that practitioner interaction styles showing the most positive correlation with alliance strength included comforting and caring, being communicative, and asking

patients questions (patient-centred behaviour). Additionally, giving information displayed a fair association with alliance strength, whereas SDM showed little or no association. Among the 17 verbal factors, two were categorised as information gathering, seven as patient involving, one as patient facilitating, one as patient supporting, and six as patient education. The strength of alliance showed a significant positive association with factors such as discussing options/asking patients' opinions, encouraging questions/answering clearly, explaining what the patient needs to know, and exploring patients' disease and illness experiences. In conclusion, the findings suggest that practitioner interaction styles displaying significant positive associations with alliance strength are those that facilitate enhanced patient engagement by actively listening to their concerns, asking questions, and demonstrating sensitivity to emotional issues. The authors recommend that practitioners utilise these findings to adapt patient interactions and incorporate communication strategies that enhance the therapeutic relationship. However, the reviewed evidence on the impact of non-verbal communication was scarce (Pinto et al., 2012).

The findings of a narrative review conducted in 2013 highlighted key communication skills that practitioners should acquire and be assessed on: 1) building and maintaining therapeutic relationships, 2) collecting information, 3) providing information, 4) decision-making, 5) addressing emotions, and 6) encouraging disease- and treatment-related behaviours (King & Hoppe, 2013). Furthermore, the results supported the association between practitioner communication behaviours and positive patient outcomes, such as better information retention, comprehension, and treatment adherence. Patients prefer patient-centred communication, which involves exploring their perspectives, understanding their broader circumstances and family dynamics, seeking common ground, and collaboratively working to enhance the therapeutic relationship (King & Hoppe, 2013).

A systematic review explored the efficacy of communication skills training programmes (Mata et al., 2021). The review included eight studies on programmes aimed at fostering changes in attitude, behaviour, and self-efficacy in doctors and nurses. Overall, the methodological quality of the studies was moderate, with certain limitations in the randomisation process and blinding of participants. The programmes employed various educational strategies, such as lectures, role-playing, case-based discussions, and video projections. The results demonstrated a significant increase in communication skills, self-efficacy, and patient-centred care in the intervention groups compared to the control groups. Moreover, using simulated patients was highlighted as an effective method for skills training, providing a safe environment akin to real-life scenarios. Future research should adopt a comprehensive and multidisciplinary approach to patient care to advance this field, involving diverse healthcare professionals and investigating the contextual factors influencing training outcomes (Mata et al., 2021).

In the context of CAM, Oths (1994) utilised a mixed-methods approach to explore the communication between a chiropractor and his patients (Oths, 1994). Data were gathered through audiotapes documenting all clinical interactions of the chiropractor over an eight-day period, formal and informal interviews with the chiropractor, his staff, and patients, patient questionnaires regarding satisfaction with care, and examination of patient files. The verbal exchanges between the chiropractor and his patients, as captured on tape, were subjected to content analysis. Tonal qualities of the exchanges were preserved, and nonverbal behaviours such as facial expressions, voice tone, and body positioning were recorded. The author identified several types of treatment sessions, each characterised by distinct interaction patterns. First, the intake session involved thorough history taking and orientation to the chiropractic belief system. The communication in the examination session was instrumentally oriented, with a high degree of information exchange. The consultation session entailed explaining findings and establishing expectations. The treatment session provided an opportunity for personal discussion and clarification of patient questions. Finally, the re-examination session clarified the patient's progress and compared prior test results to current results.

The findings reveal that the chiropractor's approach involved educating patients about a new way of understanding their health issues by imparting a coherent and understandable set of health beliefs. Efforts to educate patients about the chiropractor's unified theory of disease and to convey personal convictions about the chiropractic method commenced immediately and were reinforced throughout the therapeutic relationship. Patients' explanations of their illness closely aligned (81%) with those of the chiropractor, indicating the extent and speed of patients' internalising the chiropractor’s understanding of the patient’s condition. The number of statements made by the chiropractor decreased steadily with the length of treatment, attributed to the treatment sessions becoming shorter and more routine as the patient improved. The proportion of information exchange and positive affect followed opposing trajectories, with the former decreasing and the latter increasing over time. Self-rated patient satisfaction was very high, and there was a weak correlation between satisfaction scores and length of treatment (Oths, 1994).

Wells and colleagues (2020) explored patient perceptions of the healthcare processes experienced by older adults taking part in a clinical trial for back pain involving family medicine residents and licensed chiropractors (Wells et al., 2020). Following a twelve-week, three-arm randomised controlled trial, 115 older adults underwent individual semi-structured interviews. Two researchers then analysed the data inductively via thematic analysis. The participants emphasised the importance of practitioner communication, professionalism, patient care dedication, clinical and diagnostic expertise, and adept navigation of the healthcare system.

Overall, they reported positive interpersonal relationships with the study clinicians, highlighting the crucial role of effective patient-centred communication in building trust and shaping perceptions of care quality (Wells et al., 2020).

In a study conducted by Kee and colleagues (2018), 125 cases of patient complaints against junior doctors were analysed to understand the nature of communication errors in clinical practice, revealing that non-verbal communication was important to patients (Kee et al., 2018). Nonetheless, its importance was often overlooked by the practitioners. Extensive use of technology can reduce eye contact, leading to misunderstandings and communication breakdowns, leaving patients feeling unattended. Both evident negative facial expressions and subtle indications of disengagement affect how patients perceive practitioners' care. Paralanguage, which includes vocal aspects like intonation, volume, and cadence, is crucial in non-verbal communication. For instance, a practitioner's flat tone can convey a lack of personalised care, while an inappropriate volume, such as a raised voice, can create a negative impression. Finally, relatives of patients mentioned situations where doctors did not address their concerns but focused on their questions instead, resulting in communication errors and patients feeling overlooked (Kee et al., 2018).

Prosodic variation can convey important cues in conversations, such as signalling when a speaker has finished speaking, showing appreciation towards their conversation partners, or indicating honesty in their communication (Hirschberg et al., 2020). For instance, researchers used qualitative and quantitative methods to explore the communication patterns, turn-taking, and linguistic barriers in andrological consultations (Santi et al., 2022). The results illustrated substantial communication imbalance, revealing that patients had briefer speaking turns and longer response times, while practitioners engaged in lengthier speaking turns and exhibited higher response frequencies. The study also investigated the degree of synchronisation between the actions of patients and practitioners. Prosodic synchronisation occurs when speakers exhibit similar pitch, speaking rate, intensity, pitch accent, and phrasal tones, as well as non-verbal cues like body language and facial expressions (Hirschberg et al., 2020). When synchronisation occurred in this study, practitioners were more inclined to engage in collaborative interactions with patients, thus reinforcing their inputs and improving the coherence of the conversation. Prosodic elements, including supportive intonation and timely minimal responses, likely promoted better synchronisation (Santi et al., 2022). Practitioners sensitive to prosodic cues can tailor their communication style to patients' preferences, fostering stronger alliances and mutual understanding. Future research should investigate prosodic variation in chiropractor-patient communication, including the extent to which both parties synchronise during conversations.

A qualitative ethnographic study was conducted in the context of physiotherapy. The authors observed 52 patient-physiotherapist treatment sessions and conducted nine interviews with physiotherapists to explore the communication models in a private practice setting (Hiller et al., 2015). Thematic analysis, informed by the constant comparative method, was used to analyse the data. The findings demonstrated that physiotherapists took the lead in communication during the treatment sessions, focusing primarily on the biological aspects of the patient's condition. The study suggests that communication often aligns with a practitioner-centred model, incorporating some elements of a patient-centred approach, such as the use of touch and casual conversation. The authors recommend that physiotherapists undergo additional training to enhance their patient-centred communication skills (Hiller et al., 2015).

The imbalance in communication roles between patients and practitioners creates an inherent asymmetry. This is reflected in the distribution of tasks during clinical encounters and the focus of conversations, which primarily revolve around the patient's health condition (Bonnin, 2014). An ethnographic study focused on the adoption of the speaker's voice in mental health care admission interviews at a public hospital in Argentina (Bonnin, 2014). The authors examined data from 41 interviews. The findings suggest that interactions between patients and practitioners exhibit two key characteristics: 1) the adoption of a speech pattern by the speaker that may sound unfamiliar but is considered suitable for the listener, and 2) this adoption is linked to associating the conversation partner with a specific social role and its corresponding communication style.

From the patient's perspective, the practitioner was seen as a representative of institutionalised medicine (Bonnin, 2014). Consequently, patients mirrored bureaucratic and medical communication styles. Patients referenced their encounters as healthcare system users to emulate the bureaucratic communication style. At the same time, they incorporated technical jargon from mainstream media, the internet, and previous medical experiences to embody the psychiatric communication style. In both scenarios, elements of institutional talk were evident, particularly in relation to the participants' pursuit of specific objectives tied to their institutional identities. As a result, patients adopted these communication styles to minimise the imbalance, showing a degree of familiarity with the other party's role identity. Conversely, professionals adopted the patients' communication style to elevate their status, working towards clinical goals and enabling them to express themselves more effectively. *"Speaking at the patients' level"* involved reducing the perceived social distance by integrating certain aspects of the speaker's assumed speech pattern. The authors noted that research examining the relationship between communication styles and inequality can provide valuable insights for improving professional-patient interactions, particularly within diverse cultural contexts. To promote effective intercultural communication, it is important for healthcare professionals to

temporarily acknowledge and accept patients' perception of their authoritative role, as opposed to adopting a more casual tone. This approach is essential for bridging social gaps without reinforcing cultural divides. Moving forward, it is crucial for researchers to acknowledge and respect cultural diversity and to challenge the dominant position of healthcare professionals by analysing interactional data alongside the perspectives of both patients and professionals (Bonnin, 2014).

Researchers examined how alliance rupture segments from sessions differ from non-rupture segments based on linguistic dimensions (Christian et al., 2021). A total of 27 psychotherapy sessions were analysed using a specialised measure to distinguish between rupture and non-rupture segments. The findings suggest that during alliance ruptures, patients and therapists experience increased intellectualisation, a defence mechanism characterised by excessive focus on facts and logic to create distance from intense emotions. Patients also exhibit an increase in negation during ruptures, which suggests defensiveness and attempts at distancing. The study is the first attempt to investigate speech characteristics that differentiate between rupture and non-rupture segments. While the initial analysis focused on patient and therapist speech separately, the authors acknowledge that ruptures are two-way processes where each participant's speech interactively influences the other. Future studies would benefit from exploring alliance ruptures as a relational phenomenon (Christian et al., 2021).

1.5.3 Rapport

A scoping review aimed to assess the existing literature on rapport in healthcare settings (English et al., 2022). Thirty-four studies were identified, which yielded five definitions of rapport. Interestingly, no conceptualisations of rapport were found. Quantitative studies operationalised rapport using coding systems, questionnaires, and an observer viewpoint. On the other hand, qualitative studies identified characteristics of rapport using participant viewpoints. Common facilitators of rapport-building identified by patients, families, and healthcare professionals included *"deceptively simple acts"* and the importance of health professionals *"taking the time to connect as human beings"* with patients. For instance, participants valued a warm welcome, personalised interactions, demonstration of concern through physical gestures, spending time with patients, and appropriate use of touch. However, there was a stronger evidence base for factors hindering rapport-building, such as time tensions and perceived awkwardness leading to health professionals avoiding patients, patients, and families feeling judged and uncared for. The key findings of this review were the knowledge gap between theoretical definitions of rapport and participant views on the perceived barriers to rapport. Hindering factors included time pressure, conflict between efficiency and rapport, and failure to align with patient communication styles. These findings provide crucial insights into

rapport-building dynamics within healthcare interactions and highlight the need for further research (English et al., 2022).

In a recent review, 111 research articles were examined, encompassing 126 measures of rapport in various professional information-gathering settings such as investigative interviewing, counselling, medical interviews, teaching, and marketing interactions (Brouillard et al., 2024). The review highlighted irregularities and constraints in existing rapport measures, including limited consistency and validity. Most measures (93.8%) were questionnaire-based, utilising Likert rating scales, while a smaller percentage (6.2%) were formulated as observational coding systems. Many measures lacked explicit scoring criteria and validation, and there was a scarcity of agreement and validity among them. The review suggests the necessity for additional research to devise more resilient and dependable measures of rapport, proposing exploring observational coding systems and the urgency for a standardised, valid measure of rapport applicable across professional contexts (Brouillard et al., 2024).

Research indicates that establishing rapport is crucial in professional settings to facilitate cooperation and gather information effectively (Gabbert et al., 2021). This is especially pertinent in investigative interviews, human intelligence debriefings, and medical consultations. An analysis of 35 studies revealed that rapport-building behaviours fall into three categories: verbal, non-verbal, and para-verbal. The study identified three primary types of rapport-building practices: personalising the interview, projecting an approachable demeanour, and demonstrating active listening skills. Personalising the interview involves using the interviewee's preferred name, demonstrating interest, and finding common ground. Presenting a friendly attitude encompasses smiling, using open body language, and maintaining an appropriate tone of voice. Lastly, actively listening and demonstrating attentiveness involves using empathy, maintaining eye contact, and nodding to signal interest and understanding. The authors emphasised that the effectiveness of these behaviours can be influenced by factors such as interview format, interviewer style, and cultural norms. Understanding the intent of each behaviour is essential for selecting the most effective strategies for specific information-gathering goals (Gabbert et al., 2021).

1.5.4 Trust

In the UK, scholars noted that policy initiatives in the early 2000s have created a new context for patient-practitioner trust relations within the NHS (Rowe & Calnan, 2006). Now, it is the accepted standard for clinicians and patients to work together to make decisions about tests, treatments, and support based on clinical evidence and the patient's informed preferences (Coulter & Oldham, 2016). This has shifted the power dynamics and interdependence between

patients, clinicians, and managers. Consequently, Rowe and Calnan (2006) developed a theoretical framework illustrating how the conceptualisation of trust may evolve in this new healthcare delivery context. The change in motivations for trust formation is shifting from affect-based to cognition-based trust as patients become more active participants in their relationship with the practitioner. The framework suggests that interpersonal trust might now be characterised by an emphasis on communication, information provision, and the utilisation of *"evidence"* to support decisions in a reciprocal, negotiated alliance (Rowe & Calnan, 2006).

Trust is dynamic and can develop within different contexts, comprising emotional, cognitive, and moral components (Jones & George, 1998). The concept of trust has been described in numerous ways, including as an individual's reliance on another's word or promise, belief in a person's competence, and willingness to be vulnerable based on expectations of another's actions (Challender & McDermott, 2019). Distrust and mistrust are also part of the trust spectrum, encompassing negative expectations of others' actions, lack of confidence, and suspicion (Lewicki et al., 1998). From an expert perspective, trust can be categorised into several types, including competence trust, integrity trust, intuitive trust, calculus-based trust, system-based trust, and cognition-based trust. These types are distinguished by their basis in perceived ability, ethical behaviour, personal feelings, self-interest, faith in systems, and knowledge and understanding, respectively (Challender & McDermott, 2019).

A literature review explored the concept of trust in patients' interactions with nursing professionals (Rørtveit et al., 2015). The review included diverse patient populations, such as those with chronic kidney disease, myocardial infarction, cervical cancer, psychiatric disorders, dementia, and individuals undergoing local anaesthesia and hip surgery. The key findings highlight the importance of establishing trust through transparent communication, empathy, and SDM. The authors describe the negative impact of trust erosion caused by inadequate communication, paternalistic attitudes, and power differentials. Trust was linked with predictability, empowerment, feeling safe, being accepted, and feeling cared for. The findings also illustrate how trust can impact individuals' abilities to cope with certain situations, such as surgery, and how it can influence patients' overall well-being and willingness to seek help and improve their condition. In conclusion, the study underscores the importance of trust in various contexts and its impact on individuals' experiences. Trust plays a significant role in healthcare settings, influencing patients' abilities to open about their conditions and their willingness to engage with healthcare providers. Practitioners should demonstrate adept communication skills, competence, and compassionate behaviours to inspire patient trust (Rørtveit et al., 2015).

The concept of trust in the context of healthcare lacks a clear definition in the literature (Gille et al., 2017). On one hand, Calnan and Sanford (2004) emphasised that trust is typically based on expectations regarding the knowledge, skill, and competence of healthcare professionals, as well as considerations of fairness, integrity, and beneficence (Calnan & Sanford, 2004). On the other hand, van der Schee and colleagues (2007) proposed that public trust in healthcare encompasses not only the interpersonal trust between patients and healthcare professionals but also the mass media's portrayal of the healthcare system and the institutional commitment to providing high-quality care (van der Schee et al., 2007). To fully understand public trust in the healthcare system, Giles and colleagues (2017) argue that we need to take a more comprehensive approach that looks beyond individual experiences (Gille et al., 2017). They suggest that public trust originates in the public sphere between the individual, the healthcare system, the government, and other societal institutions. It is influenced not only by individuals' experiences and the media's portrayal of the healthcare system but also by public discourse about these experiences and the system as a whole. This approach allows for an understanding of the healthcare system as an open system where the state's experiences, perceptions, and communication practices, as well as other actors, shape public trust (Gille et al., 2017).

Bocerra and colleagues (2007) focused on identifying existing definitions and models of trust within multi-agent systems, particularly in open systems where agents from untrusted sources may operate (Becerra et al., 2007). Their review aimed to provide a set of descriptive terms to define the attributes and methods used in open trust systems and to facilitate the comparison and discussion of various trust models across different fields of study. Four key attributes for evaluating an agent's trustworthiness were discussed in their findings: integrity, motivation, predictability, and competence. Integrity refers to an individual's ethical behaviour, while motivation is their drive to complete a task. Predictability is about the consistency of one's actions, and competence assesses an individual's ability to perform a given task. The four primary methods for discovering one's attributes are 1) intuition, 2) experience, 3) hearsay, and 4) records (Becerra et al., 2007). Based on the author's definitions, intuition would involve a patient making judgments about the practitioner based on general expectations before their first clinical encounter. Experience would rely on past interactions or observations to assess trustworthiness, competence, and integrity. Hearsay would involve gathering information about the practitioner from third parties to shape trust based on feedback and opinions. Finally, utilising institutional or authoritative data about the practitioner, such as formal records, would fall under the method of records.

The authors also identified two key factors related to trust evaluation: the level of risk and one’s willingness to trust (Becerra et al., 2007). They noted that the idea of risk is essential. Professionals should understand that risk is inseparable from being open and vulnerable.

Trusting others leads to vulnerability and the potential for letdown or disloyalty. The readiness to trust is an internal characteristic that influences an individual's inclination to trust others. It involves a tendency to depend on others or to act independently based on a specific task (Becerra et al., 2007).

1.5.5 Attachment Theory

Elvins and Green (2008) emphasised that changes in a healthcare system can shape the context within which interventions occur, inevitably affecting patient-practitioner alliances (Elvins & Green, 2008). They implied that researchers should use theories from sociology and developmental psychology to explore the multidimensional nature of WA, suggesting attachment theory might be particularly relevant. Before relating attachment theory to patient-practitioner alliances, it is essential to understand its origins as a developmental theory. Bowlby, the creator of attachment theory, argued that attachment is a crucial aspect of human development, suggesting that people are biologically inclined to form attachments with others (Bowlby, 1958). He proposed that infants have an innate attachment behavioural system and outlined its function. The primary aim of the child's attachment system is to maintain a desired level of closeness to attachment figures, usually the mother or the primary caregiver.

The system can utilise specific attachment behaviours to achieve predictable outcomes. Bowlby suggests that the system functions by constantly adjusting the activation levels, initiating attachment behaviours, like physiological homeostasis (Bowlby, 1958). The system is considered goal-corrected, allowing infants to adapt to changing environments while maintaining proximity to their attachment figure (Cassidy & Shaver, 2016). When a stimulus that can terminate activation is present, the infant's attachment-seeking behaviour stops. Although such behaviours may vary depending on the context and effectiveness, they all serve the same purpose. For most infants, the caregiver functions as a *"safe haven"* to return to in times of distress and uncertainty (Cassidy & Shaver, 2016). Children gradually learn which behaviours most effectively capture their caregiver's attention. For example, crying is an aversive behaviour aimed at prompting a mother to come and offer comfort, while smiling and making sounds are signalling behaviours that show a mother that her child wants to interact (Cassidy & Shaver, 2016). It is important to note that people tend to establish attachments regardless of the attachment figure's availability and responsiveness; for example, a child can be attached to an abusive parent (Cassidy & Shaver, 2016).

Bowlby further argues that the attachment behavioural system involves cognitive components, which encompass mental representations of attachment figures, the self, and the environment (Bowlby, 1988). These representations, often referred to as representational models, allow

individuals to predict possible outcomes and make decisions about attachment behaviours throughout their lifespan. Representational models require conscious processing to be updated and perform effectively when accurately depicting reality. A secure representational model is characterised by confident expectations of attachment figures' availability and responsiveness, especially in times of distress or uncertainty. A person lacking this confidence is classified as having an insecure attachment model. Individual differences in adult attachment security shape how emotions are responded to, shared, and regulated. Attachment theorists also emphasise the role of emotion regulation in maintaining attachment security in close relationships in adulthood (Cassidy & Shaver, 2016). Individuals with a secure model prioritise intimacy and closeness in their interactions, while those with an insecure model develop additional interaction goals and behaviours as defences against attachment-related distress (Bowlby, 1988). Overall, representational models can impact behaviours, cognition, and affect in close relationships by formulating expectations about what is likely to occur in different interactions (Collins & Read, 1990).

Another important aspect of attachment theory is the attachment bond, which is considered a particular type of affectional bond (Cassidy & Shaver, 2016). Ainsworth provided criteria for affectional bonds, suggesting that they involve a specific individual, persist over time, hold emotional significance, provoke a desire for proximity or contact, and cause distress upon separation (Ainsworth, 1989). To illustrate the uniqueness of attachment bonds, she emphasised that individuals seek security and comfort from their attachment figures in the presence of a perceived threat. Although individuals form many affectional bonds throughout their lives, not all of them are attachment bonds (Cassidy & Shaver, 2016). Hence, it is essential to examine the characteristics that help distinguish them. Bowlby proposed two key characteristics of attachment bonds (Bowlby, 1958, 1988). First, attachment behaviours in a relationship do not automatically imply that an attachment bond exists. Similarly, the lack of attachment behaviours sometimes does not negate the presence of an attachment bond, which typically remains consistent over time. Second, attachment bonds represent only one aspect of the relationship, focusing on protection and security during distress and uncertainty.

A study examined the relationship between adult attachment and WA in patients undergoing psychological therapy (Taylor et al., 2015). A total of 58 participants were recruited from primary care psychological therapy services in the UK. The results found that attachment was a significant predictor of the quality of the WA. Patients with a secure attachment had a stronger WA and greater symptom improvement. Signs of insecure attachment included missed sessions and reluctance to share personal information. The study illustrates the importance of patient attachment to the therapist in determining the alliance strength and symptom change during therapy (Taylor et al., 2015).

The practitioner-patient alliance centres on addressing the patient's concerns. It incorporates a bond that reflects both parties' feelings and attitudes toward each other. This bond, which is a critical aspect of the process of care, involves emotions such as confidence, trust, liking, and respect (Fuertes, 2019). Trust plays a crucial role in developing secure and fulfilling relationships, encompassing perceptions of the person as reliable and consistent, as well as beliefs in their concern for one's needs and confidence in the strength of the relationship (Mikulincer, 1998; Rempel et al., 1985). Studies have shown that individuals with a secure attachment model demonstrate higher levels of trust towards others, have better access to positive trust-related memories, report more positive trust episodes, and utilise more constructive coping strategies when trust is violated compared to individuals with an insecure attachment model (Campbell & Stanton, 2019; Mikulincer, 1998). In short, the development of trust is influenced by individuals' attachment model, which impacts their comfort with closeness and dependence. Patients may find it challenging to feel safe or motivated enough to engage in treatment tasks before establishing trust (Maunder & Hunter, 2016). Practitioners should prioritise understanding and fostering their patients' ability to trust, recognising its crucial role in forming a strong bond (Carney, 2020). It is essential to meet patients where they are in their trust capacity rather than assuming automatic trust. Responding to signs of patient mistrust with warmth, empathy, and genuineness is crucial for creating a safe and supportive therapeutic environment (Carney, 2020).

1.5.6 Active Inference

More recently, the notion of prediction error minimisation has gained prominence in cognitive science and shaped WA's explanatory theories (Friston, 2010). Generally, the notion suggests that the human brain is a predictive organ that aims to minimise uncertainty by updating its internal model, i.e. changing its schemas of the world and the self. Parr and Friston (2019) used the term *"inference"* to describe the brain's active role in shaping sensory data to better align with its internal model (Parr & Friston, 2019). They proposed the idea of active inference as a method for understanding human behaviour, implying the brain aims to minimise error, i.e. improve the fit between its internal model and sensory data, by utilising one of two strategies. First, minimisation of the gap between sensory data and internal models can be enabled through the brain adjusting its internal model based on sensory input. In other words, the brain tends to optimise its expectations about the variables in the internal model to better match the incoming sensory data. Second, the brain can manipulate sensory data through triggering behaviours leading to sensory input in line with its expectations or through actively changing the environment to fit the internal model's predictions (Parr & Friston, 2019). According to the authors, both of these strategies aim to minimise prediction errors (Parr & Friston, 2019).

Prediction errors occur when reality differs from one's expectations: internal models cannot fully predict every possible outcome.

Scholars argue that any self-organising system in equilibrium with its environment aims to minimise prediction errors and reduce uncertainty (Parr & Friston, 2019). However, uncertainty is sometimes necessary to initiate personal growth and adaptation (Hauke & Lohr, 2022). When an individual encounters uncertainty during events associated with higher stress levels, the experience can trigger learning processes. Thus, a person should be able to tolerate uncertainty and embrace stress as a catalyst for growth (Hauke & Lohr, 2022). The therapeutic process helps patients update their preconceived dysfunctional schemas by exploring and exploiting new information (Hauke & Lohr, 2022). In talking therapies, patients are encouraged to learn how to deal with these challenges effectively (Hauke & Lohr, 2022). The role of the therapeutic relationship is to 1) ease the stress associated with the process of updating prior schemas and 2) foster resilience and adaptability (Connolly, 2022). Strong WA can increase the perception of safety during uncertainty and facilitate the revision of internal models (Hauke & Lohr, 2022). The goal of therapeutic interactions is to help patients revisit their unhelpful thoughts and behaviours, enabling the replacement of their dysfunctional schemas with healthier alternatives (Connolly, 2022).

Researchers have utilised the concept of internal models to discuss the dynamic nature of therapeutic change (Hayes & Andrews, 2020). The proposition is that therapeutic change can be described in terms of two distinct processes: 1) deterministic and 2) chaotic (Connolly, 2022; Tschacher & Haken, 2019). The former refers to a shift in a patient's behaviour in a particular intentional direction, e.g. a patient starts to engage in more healthy actions (Connolly, 2022; Tschacher & Haken, 2019). The latter refers to the broader exploration that a patient engages in - a process of self-reflection that moves beyond the existing internal model, incorporating alternative thoughts, emotions, and behaviours (Connolly, 2022). The chaotic change process involves the exploration of the various states a patient may be experiencing. It is described as a prerequisite for therapeutic change, facilitating personal growth. The chaotic process enables a patient to adopt a healthier range of thoughts and behaviours (deterministic process) and reach the desired goal of establishing these healthy alternatives as an updated internal model (Connolly, 2022).

The concept of internal models has also been applied to osteopathic care as a unifying framework that highlights the organism's dynamic adaptive system (Esteves et al., 2022). As agents, patients shape reality through the ongoing interaction with their environment (Esteves et al., 2022). Within this framework, scholars proposed the notion that chronic pain may occur if a patient tends to misinterpret harmless sensations as symptoms. Rather than the result of

incoming sensory data, this notion describes chronic pain as a narrative carefully crafted over extended periods of suffering and engagement with one's body and healthcare practitioners (Esteves et al., 2022). In other words, pain disrupts the patient's sense of agency, affecting their ability to interact with the environment. This process involves the adoption of the hypothesis *"I am in pain."* This hypothesis is continuously confirmed by selectively attending to corroborative sensory inputs, particularly in the interoceptive and nociceptive domains. To address this, osteopaths should explore alternative hypotheses with the patient to shift the patient's attention, changing the perception of prediction errors (Esteves et al., 2022).

The framework states that active inference aligns with the osteopathic notion of adaptation and aims to enhance patient-practitioner interactions and restore patient agency (Esteves et al., 2022). The alliance is considered crucial for patient engagement in healthy adaptations and revisions of dysfunctional internal models (Esteves et al., 2022). In turn, therapeutic touch is viewed as important for alliance development, mental state alignment, and biobehavioural synchrony between patients and practitioners. Biobehavioural synchrony refers to the coordination of physiological and psychological processes during social interactions, including nonverbal behaviours, autonomic functions, heart rate variability, neural synchronisation, and neurotransmitter release (Feldman, 2017; McParlin et al., 2023).

Therapeutic touch administered by a practitioner can offer comfort to patients, reduce stress, and establish a feeling of security (Ellingsen et al., 2015). For instance, a study examined the effects of therapeutic touch, specifically hand massage, on individuals with varying levels of self-criticism (Maratos et al., 2017). The research used a mixed measures crossover design with *"self-criticism"* as the between-subjects variable and *"touch intervention"* as the within-subjects variable, assessing salivary cortisol, alpha-amylase, and emotional responses before and after the interventions. The results showed that hand massage decreased cortisol levels and positive emotional responses in high and low-self-critical individuals. The authors recommended further exploration of the effects of touch on individuals and the potential benefits of integrating touch into therapeutic interventions (Maratos et al., 2017). Such integration can enhance synchrony on various levels. Therapeutic touch can help individuals identify and update maladaptive beliefs in their internal model by experiencing predicted sensations, such as learning that a fall does not necessarily mean they have sustained a severe injury (McParlin et al., 2023). Through touch, practitioners can impact pain modulation, autonomic nervous system function, and emotional processing (McParlin et al., 2022). In line with this framework, scholars elaborate:

> *To provide truly person-centred care, practitioners must move away from dualistic thinking to understand how patients' interactions with their environment affect their*

> *experiences, expectations, and beliefs. In the case of persistent pain and other physical symptoms, how they contribute to their suffering. We argue that manual therapy is still an essential aspect of osteopathic and musculoskeletal care; however, it should be used wisely within a person-centred model where contextual factors, language, reassurance, education, and non-verbal communication are effectively considered and used.*
>
> **(Esteves et al., 2022)**

Interpersonal touch is considered to play a role in emotional and socio-emotional regulation partly by facilitating physiological co-regulation through behavioural synchrony (Feldman, 2017). However, the impact of touch can be negative if it is unwelcome or if the initiator's intentions do not match the recipient's wishes (Ellingsen et al., 2015). The physical qualities of tactile stimuli, such as softness, temperature, force, and velocity, shape touch perception. Input from peripheral receptors undergoes processing and modulation before the subjective sensation of touch is perceived in the brain (Ellingsen et al., 2015). A narrative review explored the effects of social touch, CT touch (stimulation of unmyelinated afferents), and massage therapy on human behaviour and development (Field, 2019). The influence of touch was examined using methods like fMRI scans, EEG, and behavioural observations. The included studies were conducted on diverse groups, including foetuses, infants, children, adults, romantic partners, and individuals with pain syndromes. The findings suggest that touch plays a crucial role in stress reduction, relationships, and self-regulation. The author noted the need for further research on touch in relationships, including longitudinal studies and investigations into individual differences in touch sensitivity and aversion (Field, 2019).

Furthermore, research on the dynamic dyadic therapeutic interactions in musculoskeletal care is necessary to understand the interdependent processes within and between a practitioner and a patient (Esteves et al., 2022). To examine the nature and role of alliance, studies should utilise longitudinal data, exploring discontinuous and nonlinear change, focusing on patterns and individual-level data, as findings at the individual level may not generalise to group-level averages (Hayes & Andrews, 2020). A study in the context of mental health employed dynamic latent class structural equation models to analyse data drawn from two randomised clinical trials (Flückiger et al., 2022). The authors explored how patients conceptualised the alliance construct throughout cognitive behavioural therapy. The results suggest that patients who experienced an improvement in their condition on a session-by-session basis also evolved their views of the relationship with their practitioner. Most patients transitioned from perceiving the alliance as three distinct dimensions (bond, goals, and tasks) to an integrated single-factor construct. The authors challenge the notion of a stable construct, further emphasising the need

to explore the dynamic nature of practitioner-patient alliance over time (Flückiger et al., 2022). However, there is limited longitudinal research exploring alliance development throughout musculoskeletal care (Babatunde et al., 2017; Kinney et al., 2020).

1.6 Philosophical and Methodological Considerations

In this section, first I will explain the underlying philosophical framework guiding the thesis design. Next, I will discuss methodological and practical considerations, as well as the impact of Patient and Public Involvement. Finally, I will describe the primary data collection process and the related recruitment challenges.

1.6.1 Critical Realism

The philosophical stance of a scientist shapes their choice of methodology, their interpretation of the results, and the inferred conclusions (Koopmans & Schiller, 2022). Scholars often dichotomise between 1) objectivist methodologies *(*guided by positivist, deductive, and empiricist approaches) and 2) subjectivist methodologies (guided by social constructionist, inductive, and interpretive approaches) (Edwards et al., 2014). The former suggests that researchers should use quantitative methods to identify generalisable predictive models and produce objective knowledge of reality. The latter either advocate that reality is socially constructed or that objective knowledge of it is unattainable, implying researchers should explore subjective experiences via qualitative methods (Edwards et al., 2014). This over-simplified dichotomy creates a misleading view of the nature of reality (ontology) and our knowledge of it (epistemology) (Archer et al., 1998; Edwards et al., 2014). Bhaskar highlighted that neither objectivist nor subjectivist methodologies are self-sufficient, proposing that both can work together within a broader analysis of reality (Bhaskar, 1975). He contended that scholars often equate epistemology with ontology, accepting their knowledge of reality as identical to reality itself (Bhaskar, 1975).

1.6.1.1 Ontology

Bhaskar established CR as a philosophical framework in the 1970s and 1980s (Archer et al., 1998; Bhaskar, 1975). CR offers a stratified view of reality incorporating three nested domains: the real, the actual, and the empirical. The real includes existing structures and causal mechanisms that have the potential, though not necessarily realised, to produce events (Archer et al., 1998). When the potential of causal mechanisms is enabled, concrete events, which are not necessarily observable, occur in the actual domain (Archer et al., 1998). The empirical domain contains the set of events accessible through human perception (Archer et al., 1998).

The real encompasses both the actual and empirical domains. Exploring research participants' interpretation (empirical domain) of concrete events during care (actual domain) can inform our understanding of WA development. However, a critical realist would argue against the notion that patient-chiropractor relationships are reducible to concrete events and subjective experiences. The researcher should also aim to hypothesise what causal mechanisms in the real domain have produced these events and experiences in the first place.

Causal mechanisms are the entities that can generate or trigger events (Mukumbang, 2023). They are often stratified into levels, such as physical, chemical, biological, psychological, psychosocial, behavioural, social, cultural, and economic (Mukumbang, 2023). The ability of mechanisms at one level to create conditions for activating mechanisms at another level is called emergence (Danermark, 2019). A psychological-level mechanism may emerge from a biological-level mechanism, which is emergent from mechanisms at the physical and chemical levels (Sayer, 2000). However, a psychological-level mechanism is not reducible to a biological-level mechanism; thus, it still requires exploration within the level where it operates to fully grasp and explain its function (Mukumbang, 2023). When the potential of a causal mechanism is initiated, a particular outcome occurs unless opposing mechanisms prevent it (Mukumbang, 2023). Hence, this potential is contextual – a mechanism does not cause the same outcome under all conditions (Mukumbang, 2023).

From a critical realist perspective, WA development is a dynamic process co-determined by multiple causal mechanisms from various levels of emergence (Bhaskar & Danermark, 2006). The CR account of co-determination provides a framework to explore both human agency and the impact of external factors (Elder-Vass, 2010). The reasons a patient or a chiropractor gives for their behaviour can function as causal mechanisms shaping WA development. Nonetheless, akin to other causal mechanisms, the potential for such reasons to result in actions is conditional on the presence or absence of opposing mechanisms capable of co-determining individuals' decisions and subsequent behaviours (Elder-Vass, 2010). A situation described by one of the research participants when reflecting on what professional skills they considered important helps to elucidate this stratified view of reality and is related to each of the three domains in Figure 1.1.

Figure 1.1 The Three Nested Domains: An Example

Quote:	Empirical Domain:
'...I think listening skills is probably one of the key things. There were a couple of times where he [the trainee chiropractor] would say "oh, you're very healthy", but actually my blood pressure was quite elevated when I did it and actually it wasn't good for me...So, his interpretation to mine was quite different on that factor and he did not check how I interpret it...'	1) The blood pressure reading 2) Both parties' interpretations of what the reading suggests about patients' health 3) Both parties' interpretation of the clinical encounter
	Actual Domain: 1) The level of blood pressure in the patient's circulatory system (as opposed to the reading) 2) The concrete events which occured during the clinical encounter (as opposed to individuals' interpretations of them)
	Real Domain: 1) Physiological mechanisms that can influence blood pressure levels 2) The curriculum content which can be guiding the trainee's interpretations of blood pressure readings 4) Patient's lived experience which can be guiding the interpretations of their blood pressure readings 5) Patient's desire to feel validated and listened to which can shape how they interpret the trainee's actions 6) Patient's and trainee's expectations about the nature of patient-chiropractor relations 7) Established policies and procedures in the clinic which may shape these relations

1.1 The quote is from Participant 4 - the qualitative study in Chapter 3.

CR implies that patient-chiropractor WA presupposes the existence of prevailing conditions (de Souza, 2022). Research exploring the unique interpersonal dynamics within each therapeutic dyad should consider the broader sociocultural narratives that can influence expectations and beliefs about patient-chiropractor relations (Hauser, 2023). These relations embody a vast range of rights, duties, and power that can shape WA development (de Souza, 2013). Despite practical constraints, scholars should explore the role of 1) agency, 2) culture, and 3) institutional structure, as potential causal mechanisms can be located within the underlying context of action (de Souza, 2013). The role of agency encompasses individuals' capacity to engage in intentional actions. Individuals can exercise agency through self-reflection and their reasons for action or non-action serve as causal mechanisms. Human agency is shaped by the ability to self-monitor in relation to external circumstances, including cultural and institutional contexts (de Souza, 2013). The role of culture embodies the realm of intersubjectivity that

defines *"what prevailing ideas inform the actions of individuals"* (de Souza, 2013). Culture-related mechanisms include potential preconceived beliefs that can impact patient and chiropractor perspectives. The role of *"structure"* in the context of the thesis embodies the institutionalised policies and practices within a clinical setting.

1.6.1.2 Epistemology

While causal mechanisms can be explored, they can exist and act independently of our perception, hence, their nature is intransitive. In contrast, our knowledge, which is socially produced and transitive, can and will constantly evolve (Koopmans & Schiller, 2022). CR acknowledges the dynamic nature of the social world where strict regularities are less common, emphasising the concept of demi-regularities (Mukumbang et al., 2021). Demi-regularities refer to typical patterns of behaviour observed under prevailing conditions: in countervailing conditions, alternative or unintended behaviours may occur, known as contrastives (Mukumbang et al., 2021). This notion allows for a more nuanced understanding of human behaviour, implying that a causal explanation of patient-chiropractor WA is not reproducible in all contexts (de Souza, 2013). Instead, the context in which a particular relationship unfolds has a conditioning effect on the agency of the parties involved (de Souza, 2013). Therefore, scholars should aim to identify trends rather than universal predictions. CR research builds on the descriptions of such trends by hypothesising the necessary conditions that had produced them (Mukumbang et al., 2021). This process of inference making, known as retroduction, involves moving backwards from experiences in the empirical domain to a deeper understanding of causality situated in the real domain, achieved by re-contextualising events in the actual domain (Mukumbang et al., 2021).

1.6.2 Mixed-Methods Methodology

CR research often starts with a preliminary theory of the topic of interest (Mukumbang et al., 2021). I employed Bordin's conceptualisation due to its relevance and previous applications to the musculoskeletal literature (Bordin, 1979). However, scholars recommend delving deeper into the conceptual foundations of patient-practitioner alliances to advance explanatory theories across different professions and clinical contexts (Elvins & Green, 2008). I reflected on 1) how the thesis design can shape potential findings and 2) how the findings can be relevant to clinical practice. CR allows flexibility in choosing appropriate research methods based on research objectives (Mukumbang, 2023). Quantitative methods effectively reveal hidden patterns and associations, with inferential statistics enabling the identification of potential causal mechanisms. Qualitative methods, on the other hand, are better suited for describing events and studying phenomena in their natural context. While quantitative methods identify

trends, qualitative methods offer important insights into the necessary conditions shaping concrete events and experiences. This complementarity strengthens the validity of proposed explanatory theories (Mukumbang, 2023). Overall, CR advocates for scholars to consider their research objectives when adopting and integrating different methods. Quantitative approaches provide reliable descriptions and comparisons, while qualitative methods offer detailed insights (Mukumbang, 2023). Thus, incorporating both approaches is crucial for advancing the conceptualisation of the patient-chiropractor alliance.

The first paper (presented in Chapter 2) aimed to explore the alliance construct in the chiropractic profession due to the lack of systematic literature reviews on this topic. I used a mixed-method systematic review methodology to synthesise evidence comprehensively, combining qualitative and quantitative research findings. First, the review utilised a thematic synthesis approach, where the qualitative data were extracted and grouped into coherent themes to investigate patients' and chiropractors' views on the nature and role of the alliance. Second, the quantitative synthesis explored the construct's measurement in the chiropractic literature and its impact on treatment outcomes and patient satisfaction. Overall, the choice of mixed-methods methodology enabled the review to address simultaneously objectives requiring distinct methods of data collection and analysis, generating insights that guided the primary research of the thesis (Hong et al., 2017; Lizarondo et al., 2020).

The primary research combined qualitative and quantitative data collection to understand alliance development from the patients' perspectives. First, the qualitative study (presented in Chapter 3) explored alliance initiation in a teaching clinic. The utility of studying patients' views on this process lies in their clinically relevant insights into the potential mechanisms shaping early WA. Patients' perspectives were gathered through semi-structured interviews to inform evidence-based practice and training development. Second, the longitudinal mixed-method study (presented in Chapter 4) investigated patients' perspectives on alliance progression throughout care. The study employed quantitative and qualitative data to examine how their views evolved over time. The research design utilised convergent segregated approach, integrating findings through retroductive theorising (Mukumbang et al., 2021). The quantitative component aimed to explore 1) how patient alliance ratings change over time and 2) the potential relationship between patient attachment and alliance ratings. The qualitative component sought to understand how patients' perceptions of each WA dimension evolved throughout care.

1.6.3 Patient and Public Involvement, Practical Considerations, and Recruitment Challenges

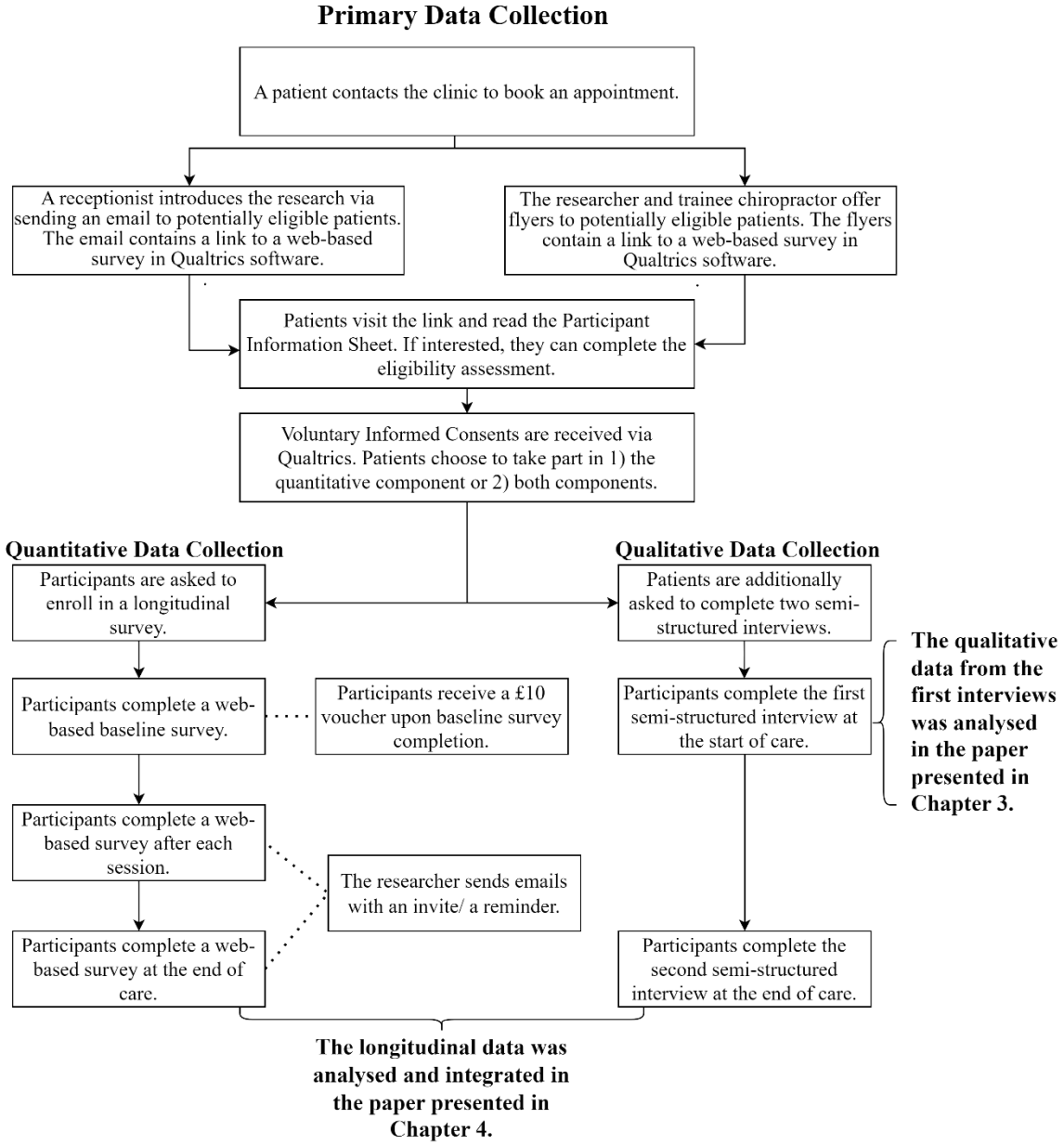
Research participants were recruited from a teaching clinic at AECCUC in Bournemouth, UK. Typically, a cohort of trainee chiropractors practice in the clinic under regular supervision and simultaneously provide services to many patients. The trainees are in the final years of master's level degrees and attend to patients presenting with a wide range of symptoms and clinical conditions. As patients' symptoms can vary in frequency, intensity, duration, and onset, treatment plans also tend to differ in the duration and frequency of appointments. The first appointment lasts approximately 105 minutes. Patients arrive beforehand, meet the trainee chiropractor, complete the initial assessment, and then go at reception to arrange a follow-up appointment.

I recruited a Patient and Public Involvement Panel to discuss practical considerations, identify potential recruitment challenges, and collect feedback on the research design and patient-facing documentation. The panel consisted of a patient, a receptionist, and a trainee chiropractor, ensuring that the perspectives of different stakeholders had been considered. I conducted one-on-one online meetings with the panellists from my Microsoft Teams university account. They were offered a £20 reimbursement for their time. The panel's feedback was incorporated into the design of the primary data collection. Throughout recruitment, which started in September 2022, receptionists advertised the research project by emailing potentially eligible patients. I employed evidence-based strategies to enhance recruitment and retention rates per the PPI panel's recommendations. To begin with, I used 1) a small monetary incentive of £10 upon enrolment (Parkinson et al., 2019) and 2) email reminders during the follow-up period (Chaudhari et al., 2020).

Regardless, the research project encountered both recruitment and retention challenges. Considering that such challenges have been previously reported in the field, I monitored recruitment and retention rates and collaborated with the supervisory team to address them (Iben et al., 2021; Russell et al., 2004). With the invaluable support from SCDTP and staff at AECCUC, I took additional steps to facilitate the data collection within the university premises. First, I amended the ethics application to shorten the Participant Information Sheet's word count and reduce the semi-structured interviews' duration. Second, I attended the clinic several times a week during the first three months to promote the project and offer printed flyers to patients. However, due to practical considerations and limited effectiveness, I decided to reduce the frequency of commutes to the clinic and use the funding more efficiently. I consulted with the Chiropractic Clinic Lead and sought help from the cohort. I recorded a brief presentation to outline the research design, asking trainee chiropractors to offer flyers to their

patients on my behalf. Then, I continued visiting the clinic biweekly or monthly to arrange organisation and ensure the flyers were available in the necessary folders. Participant Information Sheet, Consent Form, and Research Flyer are available in Appendix A, Appendix B, and Appendix C, respectively. Figure 1.2 illustrates the data collection process completed in November 2023.

Figure 1.2 The Process of Primary Data Collection



1.2 The vouchers were sent electronically as £10 Sainsbury's e-gift cards.

1.7 Summary of Thesis Chapters

1.7.1 Chapter 1

In this chapter, the evolution of the construct of WA was introduced, outlining its psychotherapy origins and conceptualisation in the psychology literature. The focus was then shifted to its conceptualisation in the context of physical health. The chapter also outlined essential research findings in musculoskeletal care, focusing on the relationship between alliance and patient outcomes. The chapter then discussed the value of investigating patient-chiropractor WA, summarising studies conducted on the nature and utilisation of chiropractic care. Theoretical frameworks and research gaps were also reviewed, with specific attention paid to applying patient-centred care to the alliance literature, including its link to SDM, goal setting, communication, rapport, trust, and attachment. Finally, an introduction of CR elaborated on the philosophical underpinnings of the thesis design, outlining the methodological considerations, the impact of PPI, and the recruitment challenges.

1.7.2 Chapter 2

The mixed-methods systematic review examined the alliance construct in the chiropractic profession. The review included qualitative, quantitative, and mixed-methods studies to investigate patients' and chiropractors' perceptions of WA, the measurement of the construct in the chiropractic literature, and the available evidence on the alliance-outcomes relationship.

1.7.3 Chapter 3

The objective of the qualitative study was to examine how alliance formation occurs at the start of chiropractic care. Semi-structured interviews with 25 adult patients explored their expectations, first impressions, and perspectives on the alliance with their trainee chiropractors. The transcripts were analysed via Reflexive Thematic Analysis from a CR stance.

1.7.4 Chapter 4

The longitudinal study used quantitative and qualitative data to investigate the temporal progression of patients' perspectives on alliance development in a teaching clinic. In line with CR, the study used a convergent mixed methods approach. The quantitative component explored how patient ratings of WA change over time and examined the relationship between the ratings and patient attachment. The qualitative component sought to understand how patients' perceptions of each alliance dimension evolved throughout care.

1.7.5 Chapter 5

The chapter begins with a comprehensive summary of the findings from the three papers. It then discusses theoretical and practical implications and integrates insights from the thesis using a graphic visualisation. Furthermore, it includes a reflection on the strengths and limitations of the three papers and outlines a general conclusion of the thesis.

Chapter 2 Mixed Methods Systematic Review of the Literature Base Exploring Working Alliance in the Chiropractic Profession

This chapter has been published as (Ivanova et al., 2022):

Ivanova, D., Bishop, F. L., Newell, D., Field, J., & Walsh, M. (2022). Mixed methods systematic review of the literature base exploring working alliance in the chiropractic profession. *Chiropractic & manual therapies, 30*(1), 35. https://doi.org/10.1186/s12998-022-00442-4

2.1 Abstract

2.1.1 Background

The construct of WA has been used to operationalise the patient-clinician relationship. Research evidence from the rehabilitation literature has established an association between the construct and several patient outcomes. The aim of this systematic literature review was to study WA in the chiropractic discipline.

2.1.2 Method

This review followed a mixed method systematic review methodology: EBSCO (The Allied and Complementary Medicine Database), EBSCO (MEDLINE), EBSCO PsycINFO, Web of Science Core Collection, Chiro index, and grey literature were searched for quantitative, qualitative, and mixed methods studies on 17th March 2021. Qualitative appraisal was conducted using the Mixed Methods Appraisal Tool, version 2018. The qualitative component was synthesised via thematic synthesis and explored patients' and chiropractors' perceptions of the nature and role of WA. The quantitative component was synthesised via narrative synthesis to examine how the construct has been measured in research and what its effect on clinical outcomes and patient satisfaction is. The findings were integrated in the discussion section.

2.1.3 Results

Thirty studies were included. The qualitative component found that both patients and chiropractors consider WA as a critical factor in the treatment journey. The findings illustrated that the construct includes the bond between a patient and a chiropractor which is underpinned by trust and attentiveness to patients' needs, values and preferences. Qualitative

data also suggested that strong WA has the potential to improve patients' adherence to treatment and that it is characterised by ongoing negotiation of expectations about the goals of care and the tasks involved in the treatment plan. The quantitative component highlighted that even though WA is relevant to the chiropractic discipline, very few studies have quantitatively measured the construct and its effect.

2.1.4 Conclusion

The findings of this review emphasise the subjective importance of WA in the chiropractic clinical encounter. However, there were not enough homogenous studies measuring the effect of WA on clinical outcomes and patient satisfaction to conduct a meta-analysis. Future research should focus on evaluating potential direct and mediated effects on patient outcomes.

2.2 Introduction

In many clinical encounters the targeted treatment regime alone is unlikely to fully explain patients' clinical outcomes (Ambady et al., 2002); the relationship between the patient and the clinician is also a critical component (Kelley et al., 2014). WA is a construct that has been used to operationalise this professional relationship (Fuertes et al., 2017). WA incorporates cognitive and emotional dimensions of the interpersonal processes between both parties occurring during care (Elvins & Green, 2008). Research has demonstrated that WA is associated with physical function, pain, disability, patient satisfaction, adherence to the treatment plan and overall perceived effect of treatment (Bishop et al., 2021; Burns & Evon, 2007; Ferreira et al., 2013; Hall et al., 2010; Toporovsky et al., 2020).

The term WA originated from psychotherapy and there is uncertainty around its conceptualisation (Elvins & Green, 2008; Horvath & Luborsky, 1993). This review adopted Bordin's (Bordin, 1979) formulation because it claims to be universally applicable (Bordin, 1979, 1994; Horvath & Luborsky, 1993). According to Bordin (Bordin, 1979), a person and a therapist, or in this case a chiropractor, unite against a common foe, for example, chronic LBP, and work towards a common goal, such as improved physical function (Bordin, 1979; Horvath & Luborsky, 1993). A strong WA between the individual who strives for a change and the person who helps them (the change agent), is crucial for the change process itself and requires ongoing negotiation of expectations (Bordin, 1979). WA has three key features: SDM and agreement on goals of the change process, collaboration on the tasks required to achieve these goals, and establishment of a bond which is based on reciprocal feelings of liking (Bordin, 1979; Fuertes et al., 2017). The mutual bond embraces interpersonal processes such as trust, acceptance and confidence and is often conceptualised in the literature in relation to patient's perception of the therapist's empathy (Horvath & Luborsky, 1993; Rogers, 1965).

A systematic review of randomised control trials and cohort studies suggested that patients' perception of the quality of the WA during treatment is a predictor for improved physical functioning and reduced pain in patients with chronic musculoskeletal pain: authors

consequently recommended that practitioners should be sensitive to and enquire about patients' perceptions of the WA (Lakke & Meerman, 2016).

Historically, chiropractors have identified themselves with a treatment predominantly focused on spinal manipulation. Increasingly however, evidence suggests that the idea of spinal manipulation being the single cause of observed clinical outcomes is unfounded given the evidential impact of contextual factors, which are part of all clinical encounters (Newell et al., 2017; Rossettini et al., 2020). Patients' interpretation of these factors amongst which are interpersonal processes inherent in WA can trigger contextual effects through innate neurophysiological mechanisms and thus impact clinical outcomes (Newell et al., 2017). Furthermore, it could be argued that strong WA can provide the foundational environment necessary for patients to benefit from the effects of contextual factors present in all chiropractic consultations (Stilwell & Harman, 2017a) by eliciting psychological and/or behavioural changes (Horvath & Greenberg, 1989). For example, a large prospective cohort study illustrated that WA decreased disability at least partly by improving patients' self-efficacy for coping and reducing psychosocial distress and the perceived threat of LBP (Bishop et al., 2021). A more comprehensive understanding of WA will enable chiropractors to learn how to skilfully use contextual factors which in turn can drive modulation of pain (Newell et al., 2017).

To our knowledge, a review of the evidence base regarding the WA between a patient and a chiropractor has not been conducted. Consequently, this mixed methods systematic review aimed to synthesise qualitative and quantitative evidence to study the nature and the role of WA within chiropractic consultations. The qualitative component of this review identified and synthesised literature concerning patients' and chiropractors' perspectives on the construct. The quantitative component reviewed additional literature investigating how WA and its features have been measured in the chiropractic literature and the effects of WA on clinical outcomes and patient satisfaction.

2.3 Methodology

2.3.1 Design

This review followed mixed method systematic review methodology (Pluye & Hong, 2014; Sandelowski et al., 2006) to consider a diverse body of information exploring WA in chiropractic and, ultimately, to inform evidence-based practice (Aromataris & Munn, 2020). The review used a convergent segregated approach to synthesis and integration (Aromataris & Munn, 2020; Sandelowski et al., 2006); the review comprises a qualitative component, a quantitative component, and an integrative interpretation of both components (the latter forms the basis of the Discussion section of this article). Separate quantitative and qualitative syntheses were conducted in parallel before the reviewer then integrated the findings from both syntheses to develop a more comprehensive interpretation. It was expected that the data and results from the quantitative studies, together with the quantitative component from the mixed methods studies, would complement the data and results from their qualitative counterparts (Sandelowski et al., 2006). The protocol for this review was registered with PROSPERO on 17.03.2020 (CRD4202123809) and can be accessed online . The review has been reported in accordance with the PRISMA statement (Page et al., 2021).

2.3.2 Eligibility Criteria

This review included quantitative, qualitative, and mixed methods studies. The qualitative component of this review considered all studies that identify and explore the perceptions and experiences of patients and their chiropractors. For studies with a broader focus, only the data relevant to WA were extracted. There is a diversity of available measures of WA in the literature, possibly reflecting the ambiguity around the conceptualisation of the term (Elvins & Green, 2008). Therefore, the quantitative component focused on studies that measured WA either implicitly or explicitly. In other words, measures which are not specifically designed to measure WA were also considered if they assess a construct related to Bordin's (Bordin, 1979) formulation of WA and its three features. Only articles with full text in English were included. No filters were applied for publication dates. Table 2.1 illustrates how the Population, Phenomena of Interest, Context (PICo) mnemonic guided the eligibility criteria (Stern et al., 2014).

Table 2.1 Eligibility Criteria

Component	Inclusion and Exclusion Criteria	Rationale
Population	Studies that include chiropractors and their patients. The inclusion criteria for chiropractors were to be licensed practitioners. If the study involved data collected from other healthcare providers or stakeholders, the study was included only if the data collected from eligible participants could be differentiated from the rest.	To study WA in the context of the chiropractor-patient relationship.
Phenomena of Interest	Studies which have either explored working WA between a patient and a chiropractor or have implicitly or explicitly explored one or more of the three WA dimensions: agreement on goals, agreement and collaboration on the tasks required to achieve these goals and the establishment of a bond.	To synthesise all findings relevant to the research questions, including the different constructs that relate to WA and any information relevant to the conceptualisation of WA in the context of the profession.
Context	The eligibility criteria were not bound to a specific country, ethnicity, or settings, but excluded studies exploring the WA in the context of physiotherapy, osteopathy, or alternative and complementary therapies other than chiropractic.	To study WA between a patient and a chiropractor in different contexts.

2.3.3 Search Strategy

The search strategy used the databases which were considered by the multidisciplinary team of reviewers as relevant to the research question and aimed to locate both published and unpublished studies.

2.3.3.1 Information Sources

EBSCO (AMED - The Allied and Complementary Medicine Database), EBSCO (MEDLINE), EBSCO PsycINFO, Web of Science Core Collection, Chiro index were searched for potentially eligible articles on 17th March 2021. The lead reviewer screened the references of the articles

selected for critical appraisal. Grey literature considered for the review included, for example, conference abstracts, unpublished trial data, theses found in sources such as Google Scholar, NHS Evidence, Trip (Turning Research into Practice) database, EThOS and OpenGrey.

2.3.3.2 Search Terms

The search strategy included terms for WA, its features, and chiropractic, combined using Boolean operators. Additional search strategy information is available in the protocol. Table 2.2 shows the search terms and how they were combined.

Table 2.2 Search Strategy

(Boolean operator) Key word	Search terms
Working Alliance	"doctor-patient relation*", "physician-patient relation*", "patient-therapist relation*", "patient-therapist relationship*", "practitioner-patient relationship*", "therapeutic relationship*", "therapeutic relation*", WA*, "helping WA*", WA*", "therapeutic WA*";
(OR) Agreement on tasks and goals	"shared decision making", "decision making", agree*, "individuali*ed care", "person centred care", "person centered care", "goal setting", "setting goals", goal*, collaborat*;
(OR) Bond	bond*, "mutual liking", trust, empathy, empathetic, confidence, appreciation;
(AND) Chiropractic	chiropractic, chiropractor*

2.3.3.3 Selection Process

Two reviewers screened titles and abstracts independently using Rayyan (Ouzzani et al., 2016). Screened, potential eligible studies were then read in full to confirm their eligibility. Differences in opinion were discussed and resolved. Some citations from the databases were from chiropractic conference summaries containing multiple abstracts; each such abstract was screened manually by one reviewer. Lastly, one reviewer also screened the reference list of the already included articles.

2.3.4 Data Collection Process

The reviewer collected the following data from all papers: study aims, participants, methodology, methods of data collection, methods of analysis, key results, and details about the research context, and information about the conceptualisation of WA or its three features.

2.3.5 Quality Appraisal

The quality appraisal was conducted by two reviewers using MMAT 2018, which includes a combination of individual components and mixed methods approaches (Hong et al., 2019). MMAT focuses on assessing the methodological quality of the studies as the most essential criteria when it comes to validity of the findings (Hong et al., 2019). The evaluation of methodological quality in this review ensured transparency about the limitations of the papers, even though studies were included based on relevance to the research question rather than MMAT score (Hong et al., 2019).

2.3.6 Qualitative Synthesis

Qualitative studies, and mixed methods studies that included qualitative component were subjected to a thematic synthesis: qualitative data were extracted and grouped into themes (Thomas & Harden, 2008) to explore the nature of WA and patients' and chiropractors' perception of it. The qualitative component consisted of the *"results"* or *"findings"* section of the studies, including quotes and the authors' interpretations of their qualitative data. The synthesis followed the three phases described by Thomas and Harden (Thomas & Harden, 2008): coding, developing descriptive themes, and generating analytical themes. The synthesis started with a focus on the data with free line-by-line coding during the first phase which enabled familiarisation with the data. The subsequent readings ensured that information relevant to WA was coded according to its meaning and content. The second phase involved grouping the identified codes into descriptive themes and comparing the initial codes across studies, merging some of them and creating new ones. The third phase involved generating analytical themes to produce a framework exploring the nature of WA in chiropractic consultations (Thomas & Harden, 2008). During the third phase of the synthesis, the qualitative data were reviewed in a deductive manner to look for codes that explore WA from the

perspectives of chiropractors and patients. During the last two phases, the qualitative synthesis was additionally reviewed by and discussed with F.L.B. (an experienced qualitative researcher), D.N., and J.F. to ensure coherence between the generated themes and the corresponding qualitative data.

2.3.7 Quantitative Synthesis

Narrative synthesis was chosen instead of meta-analysis because of the clinical and methodological diversity of the ways that WA and its features were explored (Aromataris & Munn, 2020; McKenzie & Brennan, 2019). The narrative synthesis aimed to examine how WA and its features have been measured in the literature and what the impact of WA is on clinical outcomes and patients' satisfaction (Popay et al., 2006). To address these questions, firstly, data were extracted from the primary studies in tabular form to generate a preliminary synthesis of findings. Then, the data were explored to determine whether studies could be clustered according to the characteristics in the data-extraction table (Popay et al., 2006). For example, the data were clustered and grouped depending on the measurement tool used to study WA. Next, the relationships in the data were examined to produce a narrative synthesis via tabulation illustrating how WA or its features (Bordin, 1979) were measured. A similar process was used to show the effect of WA on clinical outcomes and patients' satisfaction.

2.3.8 Integration of Quantitative Component and Qualitative Component

The convergent segregated approach to integration was selected because the qualitative and quantitative research components were expected to address different dimensions of WA (Aromataris & Munn, 2020). The convergent design enabled the comparison of qualitative and quantitative findings (Hong et al., 2017). The results of the qualitative and the quantitative synthesis were configured according to the JBI methodology for mixed methods systematic reviews (Aromataris & Munn, 2020). This involved quantitative components and qualitative components being configured to explore if individual syntheses were supportive or contradictory, if the qualitative findings explained the quantitative findings, and to find out if all parts of the quantitative component were explored in the qualitative components and if all parts of the qualitative components were tested in the quantitative components (Aromataris & Munn, 2020).

2.4 Results

2.4.1 Study Inclusion

The database search resulted in 3913 records, of which 1597 were duplicates. The remaining 2315 records were screened. Citations of conference summaries contained 849 additional abstracts and were screened separately. Citation searching included the screening of 1287 references. The PRISMA flow diagram illustrates the study selection process (Page et al., 2021) and is available as Appendix D.

2.4.2 Quality Appraisal

Sixteen quantitative, seven qualitative and seven mixed method studies were reviewed after passing the screening criteria of the MMAT (Hong et al., 2019). Table 5.2 shows MMAT scores for the design criteria: each included study was assessed based on five questions (presented in the captions) depending on its methodology. For mixed-method studies, quality appraisal was first completed against the mixed-method design criteria. Then the qualitative and quantitative components were assessed separately. The most common concern in the quantitative studies was the risk of nonresponse bias, a challenge reported from previous research projects exploring the chiropractic profession (Dhopte et al., 2019; Innes et al., 2019). While qualitative studies were appraised highly on the methodology criteria, the qualitative components of some mixed methods studies were not reported in sufficient detail (Cherkin & MacCornack, 1989; Jamison, 1996; Jamison, 2000).

2.4.3 Qualitative Component

2.4.3.1 Summary of Included Studies

The included qualitative studies and qualitative components of mixed methods studies used observations, interviews, and focus groups. The qualitative findings of two mixed-method studies were reported in limited detail, hence they did not contribute substantially to the thematic synthesis (Cherkin & MacCornack, 1989; Jamison, 2000). Table 5.3, which is in Appendix F.1, summarises study characteristics.

2.4.3.2 Themes

The thematic synthesis generated five themes: (1) Chiropractic care as a change process; (2) Chiropractic treatment as collaboration; (3) Communication; (4) Patient-centredness as agreement on values, preferences and needs; and (5) Trust. The theme (3) Communication consists of two subthemes: Effective communication and Conflicts. Each of the themes is explained and illustrated by example quotes.

2.4.3.2.1 Chiropractic care as a change process

This theme demonstrates how the qualitative findings portrayed chiropractic care as a change process. In an ethnographic case report, Bolton (Bolton, 2000) analysed the therapeutic encounters between one chiropractor and his patients as *"a communicative and performative event"* (p.309). The author (Bolton, 2000) proposed that during each encounter a *"healer"* is expected to validate four intrinsic claims which are generalisable to different therapeutic approaches and which can be validated in diverse ways depending on the *"healer"* (p. 309). A chiropractor is expected to validate each claim they elucidate to establish and maintain trust between them and their patients (Bolton, 2000), and one of these claims states *"I am making changes that will be realised in an improvement in your illness"* (p.309). Applying Bordin's (Bordin, 1979) formulation of WA to Bolton's analysis (Bolton, 2000), the role of the chiropractor in patients' care could be viewed as that of a change agent. In another study exploring the process of establishing trust, Oths (Oths, 1994) described how a chiropractor tends to explain to new patients that this change may be a prolonged process: *"Most people don't feel better 'til after several treatments. Be patient, don't get discouraged. It takes time." (p.96). While in general the passage of time is necessary for the validation of the claim that a practitioner will bring change to patients' circumstances (Bolton, 2000), "the patient is invited to accept or autonomously chooses to accept other more immediate criteria by which to validate it"* (p.315). For example, change is *"often emphasised and punctuated by loud cracks as Dr Miller adjusts the patient's spine"* (p.315). Furthermore, Jamison (Jamison, 1996) suggested that the working relationship has therapeutic elements, and the encounter could have an *"intrinsic psychotherapeutic effect"* because of this perception that change is happening: *"Formulation of a working diagnosis resulted from dynamic interaction between the patient and the practitioner, and this became the focus for immediate therapeutic intervention. Something was*

being done!" (p.97). Patients also confirmed the importance of this notion of change (Maiers & Salsbury, 2021): *"The only thing that would really make it [treatment] worthwhile is if I felt comforted from it, or I had a slight glimmer of hope that there's going to be improvement. Otherwise, I don't see the purpose in it"* (p.11). Patients also noted that their idea of the change they desire to see is individual and subjective (Maiers & Salsbury, 2021): as one participant emphasised *"every patient here has their own story, so what is good for one person may not be good for another person." (p. 6). For chiropractors, this change may include not only the physical but also the psychological aspect of patients' wellbeing (Stilwell & Harman, 2017b): "We just try to change the mind-set right out of the get go."* (p. 224). The change process may require patient education to facilitate negotiation and establish what the desired change can be and how to work collaboratively towards it. As one practitioner explained, the role of a chiropractor should prioritise patients' needs and preferences (Stilwell & Harman, 2017b): *"…the focus should be revolving around their wants, not trying to subjugate their wants to my own…"* (p. 225).

2.4.3.2.2 Chiropractic treatment as collaboration

On one hand, collaborative working was illustrated when a practitioner gives homework, offers education, provides explanations, and ensures that patients understand and agree. On the other hand, this theme also emphasises the role of patients' active engagement in their treatment journey. According to the data, the relationship between the patient and the chiropractor is cooperative in nature (Oths, 1994): *"Under chiropractic care, treatment is often negotiated with the patient, respecting the patient's autonomy."* (p. 98). As the quote suggests, this theme also demonstrates the importance of negotiation.

Some patients in the qualitative component acknowledged their role in this change process (Stuber et al., 2018): *"…every time I go there, I get good advice, whether it's 'have you tried this'? Or with respect to changing your eating habits or some exercises…. 'You know every time I go, it's almost like I get a little nugget of information to get a shot to make the quality of my life better."* (p. 4). Patients can have a more proactive approach (Connor et al., 2021): *"I'm a proactive patient and that feels positive. The chiropractic treatments were amazing in that way. I learned about a new form of treatment and [another way to be proactive]"* (p.159). In such cases, the change process is indeed a negotiation between the patient and the chiropractor

(Connor et al., 2021): *"I trusted [the chiropractor] would understand, and he would always shift [his approach] based on whatever I was saying"* (p.159). Conversely, some patients expect that their involvement in bringing about change will be minimal, and their practitioner is the one that will improve their circumstances (Stilwell & Harman, 2017b) *"I paid her to fix my back. I didn't pay her to teach me how to fix my back"* (p. 224). Sadr and colleagues (Sadr et al., 2012) noted in their study that *"only a few of the patients seemed to be very knowledgeable about their pregnancy and asked questions or challenged their chiropractors about various techniques or treatment"* (p.4). It could be argued that educating the patient about their health and providing clear explanations about their treatment options may empower them to be more proactive in the negotiation. For example, Jamison (Jamison, 1996) explored the establishment of WA in chiropractic and noted that although patient education was not a feature of every clinical encounter, it was *"a component of the total therapeutic regime and provided a foundation upon which patient could actively pursue shared therapeutic goals"* (p. 97). One of the chiropractors also emphasised the role of patient education (Sadr et al., 2012): *"I think the more knowledge they have [patients], the better they are… the woman who is going through the first pregnancy is very scared, hesitant, anxious and wants that kind of knowledge, and wants the practitioner to know what they're going through and set their mind at ease."* (p.4). Overall, patients valued practitioners' efforts to explain and teach them how to do things correctly (Stilwell & Harman, 2017b) *"instead of just printing off some exercises"* (p. 225).

Regardless of participants' beliefs about the level of their personal responsibility in their care process, the data revealed that patients would like to know what the plan is for bringing about change. Chiropractors considered that to be cooperative in nature, their approach should be honest and compassionate (Connell & Bainbridge, 2020): *"What I always say is that 'We're going to try to get you better, it might not be me. I might need help with other people. But the end result is that I'll do everything I can to help you out'."* (p.103). Overall, qualitative data from chiropractors suggest that this collaboration includes communication, patient-centredness, mutual trust. The following themes will discuss in more detail these components of a collaborative working relationship.

2.4.3.2.3 Communication

The third theme describes the communication between a patient and a chiropractor. First, example communication techniques serving different purposes were identified and are discussed in subtheme Effective communication. Second, potential conflicts are described as part of the clinical encounter in subtheme Conflicts.

2.4.3.2.3.1 Effective communication

It was noted in one study (Sadr et al., 2012) that *"communication between chiropractors and patients depended on the knowledge level of both parties"* (p.4). Considering the importance of mutual understanding for collaboration as discussed above, one of the key communication goals should be clear explanation. A chiropractor should invest time to explain and to ensure that the patient has correctly interpreted the information (Connell & Bainbridge, 2020): *"clear and timely communication is an opportunity for chiropractors to understand patient expectations and assure patients that they are in a safe environment"* (p.102). Practitioners acknowledged the importance of clear explanations in the negotiation process (Stilwell & Harman, 2017b): *"We try to really map it out in layman's terms, this is why this is affected, and this is why if we can take the time to put in the work, it's going to help. I think that's been the most effective approach for sure, for adherence."* (p. 225).

An explanation can be facilitated using non-verbal communication or analogies to illustrate a point (Oths, 1994): for instance, *"…during his explanations, the D.C. often actively demonstrates the movement or procedure he wants his patients to practice, thus identifying with the role of the patient."* (p.97). This is useful for the patient in two ways: not only will they have a mental image of what the movement should look like, but also, they will feel more confident about doing it. Referring to Bordin's formulation of WA (Bordin, 1979), prioritising clear explanation as a communication goal can facilitate reaching a mutual agreement in relation to the goals of treatment and the tasks involved in the treatment plan.

Jamison (Jamison, 1996) showed that practitioners may engage in both social and professional interaction with their patients: communication would be *"characterised by acceptance both of the patient as an individual and of their complaint as valid and worthy of diagnostic consideration and therapeutic intervention"* (p. 96). Similarly, Mior (Mior, 2010) discussed the

qualitative data in their study by emphasising that *"the nature of the communication went beyond exploring the presenting complaint - the symptom - it focussed upon how their condition impacted upon the whole patient"* (p. 153). In scenarios where the focus is the presenting complaint, communication may be entirely instrumentally oriented (Oths, 1994): *"During an orthopaedic examination of a patient, the doctor is intent upon identifying the problem. A long battery of range of motion and pain tolerance tests are given. Therefore, most statements made are instrumentally oriented, usually consisting of directions, requests, and some information."* (p.97). Different communication techniques would be relevant if the purpose of communication is bonding on a more personal level. A chiropractor may use language in a person-centred manner (Oths, 1994) when they do not *"depersonalise a patient by referring to body parts with a definite article (e.g., 'the' neck looks fine today) but rather use a possessive pronoun (e.g., 'your' knee is swollen)"* (p.105). Chiropractors recognised that the rapport can be further strengthened by comments of praise, encouragement, and reassurance (Oths, 1994). Again, the role of non-verbal communication is key: a smile, handshake or eye-contact can create a friendly environment and the ability to read patients' body language can inform a chiropractor on how to react accordingly (Connell & Bainbridge, 2020; Oths, 1994). In other words, participants discussed the establishment of bond as an intentional goal of communication and recognised that this goal requires a particular set of communication techniques.

For example, active listening is of the utmost importance (Connell & Bainbridge, 2020): *"Uninterrupted listening provides an opportunity for patients to feel engaged and was described as a method of forming meaningful connection."* (p.101). Chiropractors mentioned that active listening requires time (Stuber et al., 2018): *"You try to direct the discussion as much as possible but give the patient the time to really explain what their experience has been, you know? I find that breaks down barriers really quickly and builds trust and confidence in a new person."* (p.5). Patients want to feel empathically understood and listened to (Stuber et al., 2018): *"We have a great relationship, and we talk a lot during the treatments, so I feel like my needs are being met"* (p. 5). Conversely, a condescending, disrespectful, disinterested approach was described as a factor leading to dissatisfaction with care quality (Crowther, 2014). The role of active listening is also central when the goal of communication is

SDM or negotiation. In fact, one of the potential causes of conflicts between a patient and a chiropractor is misunderstanding.

2.4.3.2.3.2 Conflicts

In the data, the definition of conflict included differences in opinion, tension, misunderstandings, failure to manage patients' complaints, and unwillingness to refer the patient to other specialists. Oths (Oths, 1994) described example conflicts in the following context: *"Disagreements, tension, and passive and active antagonism tend to surface during critical points of the clinical encounter. Differences of opinion were sometimes voiced between doctor and patient. At times, this attested to the strength of their relationship when either showed s/he was not afraid to question or criticise the other's opinion."* (p.102). Differences in opinion were viewed as a test of the WA, which could be resolved via empathy, negotiation, and active listening.

While using communication techniques with a specific goal in mind can be effective, this can make a chiropractor less attentive to their patient's comments when they focus on the task at hand. Non-attentiveness may also be the result of chiropractor's beliefs. If a practitioner expects that the cause of pain is entirely biomechanical, then he or she may be less attentive to patient's social and psychological concerns (Bolton, 2000): *"Dr. Miller explains that because of the power of the manual muscle test he does not need to get a detailed personal history from the patient: the body will tell him everything he needs to know. Consequently, much of the conversation is characterised by apparently unmotivated comments and questions about family, work, etc, and general medical advice"* (p.308). Similarly, a patient described their negative experiences with chiropractors (Mior, 2010): *"I don't think that they showed the attention that they should have to the aches and pains that you were saying. They were almost focused on; well, this is what works and telling you that this is what the other doctors used to do, and it does work"* (p. 157).

Occasions where non-medical details about a patient were remembered were considered beneficial for building trust. In contrast, beliefs about chiropractor's sincerity could be undermined by their non-attentiveness (Oths, 1994): *"this non-attentiveness seems to be the root of much of the tension occurring in exchanges"* (p.103). Similarly, Mior (Mior, 2010) found

that patients questioned the value of their treatment and the intentions of their chiropractor when too little time was spent building interpersonal relationships. Consultations where the practitioner only used manipulative therapy without any other therapies or did not prescribe exercises or lifestyle recommendations were perceived as negative experiences (Mior, 2010). To avoid potential conflicts, chiropractors should pay attention to and seek to address potential signs of disagreement in a patient (Oths, 1994), which may be *"expressed as passive tension, primarily in the form of nervousness (usually with new patients), insecurity, overcaution, and dependency"* (p.102). In cases of conflict (Oths, 1994), chiropractors' negativity may be *"expressed as open antagonism, manifested by impatience or interrupting the patient"* (p.102). Conflicts are a likely part of the working relationship: attentiveness to the expectations of both parties involved should be prioritised.

2.4.3.2.4 Patient-centredness as agreement on values, preferences and needs

Qualitative results from one of the studies (Salsbury et al., 2018) described patient-centredness as *"the quality of a chiropractor (and, importantly, all staff members) that demonstrates a provision of care that is respectful and responsive to the patient, and which is inclusive of the person's values, preferences, and needs"* (p.6). Often it is *"expected the chiropractor to demonstrate this same quality (patient-centredness) in their interactions"* (p.6). Overall, the person-centeredness may facilitate collaboration during care and the this theme provides examples.

Some patients (Salsbury et al., 2018) considered that *"…the chiropractor should have personal knowledge of each patient as well as information about the history of their injury and his or her current medical conditions. Such personal knowledge should then be integrated into the evolving care of the individual patient"* (p.6). Such personal knowledge might enable practitioners to better understand each patient and facilitate collaboration. Indeed, patient's perception that their chiropractor does not understand them was identified as a barrier to exercise adherence: considering patients' values, preferences, and needs may influence patients' active engagement in their care (Stilwell & Harman, 2017b). Patient-centredness may also impact the establishment of a mutual bond (Connor et al., 2021): *'Participants also noted that the chiropractors listened and "would understand" and "shift" in response to their concerns, a cornerstone to building a trusting relationship'* (p.149). While trust is a key

interpersonal process underpinning this bond, there are other positive feelings which patients associate with chiropractors whose approach is patient-centred (Stuber et al., 2018): *"It's easy to feel like you're friends with those kinds of professionals."* (p.5). Interestingly, the findings revealed that person-centredness comes with its challenges. For instance, a chiropractor (Stilwell & Harman, 2017b) shared that they have *"probably sent people for x-rays as peace of mind for the patient"* (p. 224). Some practitioners felt that patients' previous experiences and beliefs may have negative impact on the change process (Stilwell & Harman, 2017b): *"...they still feel like they need or they want the adjustment ... we do it if we need to... but we don't just kind of cater to expectations or wants from previous experiences..."* (p. 224). A practitioner (Sadr et al., 2012) noted: *"The bio-psycho-social model is very relevant too. Because they are not all coming to me from nice family units..."* (p.5).

The following quote from one of the studies (Mior, 2010) provides a good summary of this theme: *"The majority of patients felt the chiropractic care they received was patient-centred. They interpreted this as being involved, informed, and participant in approving the care they received. They reported being an active participant in the decision-making process of their care and the chiropractor seemed respectful of the patients' needs and concerns."* (p. 157). The examples discussed in this theme reveal how patient-centred approach which treats the patient as an individual with needs, values and preferences can facilitate the formation of WA and its three components: agreement on the goals of care, agreement and collaboration on the treatment plan and the foundation of positive reciprocal feelings. The next theme examines one of the key interpersonal processes involved in this mutual bond- the trust between a chiropractor and a patient.

2.4.3.2.5 Trust

One study exploring the therapeutic encounter revealed that trust has a specific role in the working relationship (Bolton, 2000): *"Dr Miller's fundamental claim is that he is a healer. By this claim to legitimacy, he asserts that he is a qualified and practicing authority in the healing arts, and potentially helpful to people who present to him. As such he is allowed to make certain kinds of statements and do certain things, patients are correct to consult him in illness and he is entitled to the respect and rights accorded healers."* (p.310). It was suggested that practitioners' trustworthiness depends on the credibility of chiropractic in general, which is

usually validated through scientific evidence, experience, and good reputation. If the role of the chiropractor is that of the change agent, there are standards that should be considered. For instance, the chiropractic profession in UK is regulated by law: The Chiropractors Act 1994 provides statutory regulation, and the title 'chiropractor' is protected under this legislation (1994). However, there are normative expectations which are more subjective and are examples of contextual factors in general clinical encounters. For example, the title doctor, the white coat, the tidy office, the medical jargon, the framed diplomas, and certificates, are all instances of symbolic representations of credibility. It should be noted that such contextual factors may also impact patients' perception of chiropractor's trustworthiness. One study (Bolton, 2000) described how *"for some patients a clean office and an air of professional decorum are indicative of professional propriety and trustworthiness"* (p.310).

The notion of honesty was emphasised (Connell & Bainbridge, 2020): *"Participants suggested that a trusting relationship would be established more quickly if they admit to mistakes and acknowledge their own limitations, which sometimes resulted in a referral."* (p.101). As the following quote shows, referring patients to other healthcare professionals who can better address their needs may increase their trust in the chiropractor (Connell & Bainbridge, 2020): *"When I refer them out to another discipline, another chiropractor or something like that, that actually they trust me more than anything else"* (p.103). Chiropractors also acknowledged that agreement on goals and tasks is key for the establishment of trust between them and their patients. As one participant (Connell & Bainbridge, 2020) explained about his approach: *"I tell them at the very beginning that I will never do things by surprise. I will always explain a thing before I do it. You are always the boss, I'm not. This visit is about you not me."* (p.103). Considering that the process of building trust is unique for each working relationship, chiropractors also pointed out the role of non-verbal communication. First, patients' nonverbal communication reveals their level of trust and comfort in each situation. Second, chiropractors use their own nonverbal communication to establish trust (Connell & Bainbridge, 2020): *"eye contact, firm handshake, knowing when and when not to touch somebody"* (p.102).

2.4.3.3 Summary

In summary, the qualitative synthesis illustrated the nature and role of WA in the chiropractic encounter. The professional relationship between a chiropractor and a patient aims to be

cooperative in nature, involving collaboration and effective communication which is characterised by active listening, clear explanations, and patient education. The findings revealed the importance of trust and ongoing negotiation of expectations of the treatment plan whose main goal is to bring a mutually agreed upon change to patients' circumstances.

2.4.4 Quantitative Component

First, this section provides a summary of the included study designs and participants. More details about each study (participants, methods of data collection, and data analysis) are shown in Table 5.4, which can be found in Appendix F.2.

2.4.4.1 Quantitative Study Characteristics

The 23 included papers were comprised of quantitative descriptive studies, randomised controlled trials and a study conducting analysis on documents. The quantitative components of mixed method studies used questionnaires. Most chiropractic patients presented with musculoskeletal problems. Two studies focused on women with migraine and pregnant women. Studies were conducted in US, Canada, Australia, UK, the Netherlands, and Sweden.

2.4.4.2 How is Working Alliance Measured in the Chiropractic Literature

Table 5.5, which can be found in Appendix F.3, illustrates how WA was explored either explicitly or implicitly and which measurement tools were used. This included validated tools designed to measure WA, surveys, and questionnaires asking participants about their relationship with their chiropractor and/or assessing any of the three features of WA proposed by Bordin (Bordin, 1979). Only two studies measured WA explicitly (Jamison, 1996; Lambers & Bolton, 2016). First, Jamison (Jamison, 1996) used a mixed-method study to explore the perceptions and experiences of patients during care. The questionnaire designed for the quantitative component included, for example, items assessing patients' perceptions of their psycho-emotional state before treatment and their expectations of their psycho-emotional state after treatment. Second, Lambers and Bolton (Lambers & Bolton, 2016) used patient and chiropractor versions of the "Werkalliantievragenlijst (WAV-12) (Stinckens et al., 2009), which is a shortened and revised version of the Working Alliance Inventory (WAI) (Hatcher & Gillaspy, 2006; Horvath &

Greenberg, 1989; Stinckens et al., 2009). Table 5.6 provides a more detailed summary of how WA and its components were measured.

2.4.4.3 What is the Effect of Working Alliance in Chiropractic on Clinical Outcomes and Patients' Satisfaction

Eight studies measured patient satisfaction by using scales consisting of items which also assessed aspects of WA. For instance, a 27-item satisfaction questionnaire adapted from the chiropractic satisfaction survey (Sawyer & Kassak, 1993) was used by Boudreau and colleagues to explore patient satisfaction associated with the introduction of chiropractic services within a military hospital (Babatunde et al., 2017). Example item assessing aspects of WA included in this questionanire was *"My chiropractor treated me with respect"* which implicitly explored the bond (Bordin, 1979) between a patient and their chiropractor (Babatunde et al., 2017). While the findings of the quantitative component suggest that WA plays a role in patients' subjective evaluation of their satisfaction with care, no studies measured the impact of WA on either clinical outcomes or patient satisfaction explicitly. Three studies examined the impact on clinical outcomes using tools which implicitly explored WA by measuring the impact of doctor-patient encounter (DPE) (Haas et al., 2014) and patient satisfaction (Hurwitz et al., 2005; Mior, 2010). First, Haas end colleagues (Haas et al., 2014) measured LBP intensity via the Modified Von Korff pain scale (Underwood et al., 1999) to evaluate the effects of the DPE via path analysis. The results revealed that DPE was a determinant of LBP at both follow-ups at six and twelve weeks (Haas et al., 2014). Second, Mior (Mior, 2010) used a variable reflecting the patients' subjective report of symptomatic improvement after receiving their treatment. He reported that the results of regression analyses showed that both high patient satisfaction and feeling much better following a treatment were positively associated with ratings of the chiropractor as a high performer on all the PCAS scales (Safran et al., 1998). Next, Hurwitz and colleagues (Hurwitz et al., 2005) explored the effects of patient satisfaction on subsequent changes in pain and disability among LBP patients with the 24-item Roland-Morris Disability Questionnaire Disability (Roland & Morris, 1983a, 1983b) and remission from clinically meaningful pain and disability. Authors (Hurwitz et al., 2005) found that higher satisfaction improved the odds of remission from clinically meaningful pain and disability at 6 weeks. It should be noted that these three studies measure constructs adjacent to WA and findings

should be interpreted with caution. Table 5.7, which can be found in Appendix F.5, shows more details of the results.

2.5 Discussion

2.5.1 Summary of Findings

This review included thirty studies exploring aspects of the WA between a chiropractor and their patients to study its nature and role within the clinical encounter. The qualitative component highlights the importance of WA during the treatment process and emphasise the role of effective communication. For patients, the perception that their beliefs, values, and preferences have been attended to by the practitioner strengthens the WA and might facilitate treatment adherence. For chiropractors, patients' previous experiences, unhealthy beliefs and unrealistic expectations can challenge the establishment of a collaborative working relationship. Most of the studies included in the thematic synthesis had good methodological quality. The qualitative findings of two mixed-method studies did not contribute substantially to the synthesis (Cherkin & MacCornack, 1989; Jamison, 2000). This was due to the lack of details provided by the authors: it was unclear whether the findings were adequately derived from the data and the interpretation of results was not sufficiently substantiated by data. The quantitative component found only two studies explicitly investigating the WA between a chiropractor and a patient (Jamison, 1996; Lambers & Bolton, 2016). The studies included in the narrative synthesis were appraised highly on most methodology criteria apart from the risk of non-response bias. However, this criterion did not impact the quality of the synthesis in regards to investigating how WA and its features have been measured in the literature. To our knowledge, no studies have explored explicitly the impact of WA on clinical outcomes and patient satisfaction.

2.5.2 How do the integrated findings of this systematic review fit the wider literature

Babatunde and colleagues conducted a scoping review of the literature studying WA across physiotherapy and occupational therapy (Babatunde et al., 2017). They found that WA has been explored only to a limited extent in the rehabilitation literature and suggested that future

research should prioritise clear conceptualisation of the construct (Babatunde et al., 2017). The findings from our review of WA in chiropractic illustrate the potential which the construct and Bordin's theory (Bordin, 1979) have to explain how the relationship between a chiropractor and a patient influences treatment outcomes through psychosocial pathways.

The qualitative synthesis suggests that chiropractic care can be considered as a prolonged change process in which collaborative working relationships between patients and chiropractors are especially important. At the start of care, a patient who seeks help to change their circumstances and a chiropractor whose role is that of the change-agent begin a treatment journey together. Strong WA can facilitate the change process ensuring its cooperative nature: our synthesis related patients' and chiropractors' experiences of therapeutic relationships to the role of the three features proposed by Bordin (Bordin, 1979): agreement on the goals of care, collaboration on the treatment plan, and the establishment of a bond. For instance, the quantitative synthesis shows there might be a mismatch between patients' and chiropractors' expectations about what patients' role in the treatment journey should be (Jamison, 2000). Second, agreement on the treatment plan should be reached: comprehensive instructions of what is required from the patient can promote a proactive approach to care by shaping patients' beliefs about their own capability (self-efficacy) to adhere to the treatment plan (Bandura et al., 1999). The qualitative synthesis suggests that patient education regarding the treatment plan is crucial: patients appreciate when they understand how the recommended tasks can lead to the desired outcome. In line with a patient-centred approach, which is a paradigm of chiropractic (Gatterman, 1995), strong WA involves SDM throughout care and focuses on individuals' preferences, needs, and values. The current findings show that there could be a discrepancy in patients' and chiropractors' perceptions of the level of collaboration between them and their chiropractor (Lambers & Bolton, 2016). Practitioners should continuously try to collaborate with their patients to ensure that agreement on treatment plan and goals of care is established during all stages of this journey (Lambers & Bolton, 2016). The third key factor impacting this change process is the bond underpinned by reciprocal positive feelings of respect and trust. For example, the qualitative synthesis illustrates that such a bond is key when chiropractors aim to identify and change patients' unhealthy beliefs and behaviours which might be compromising their treatment progress (Stilwell & Harman, 2017b).

This notion of considering chiropractic care as a change process is in line with the dynamic model of treatment perceptions (Yardley et al., 2001). The model was developed using grounded theory analysis to analyse interview data from patients receiving chiropractic treatment for back pain and was then tested using interview data from people undertaking exercise therapy for dizziness (Yardley et al., 2001). According to this model, at the start of this journey, patients have their abstract treatment perceptions which reflect their personal beliefs, values, norms, as well as their illness representations and health-related beliefs (Yardley et al., 2001). These newly modified treatment perceptions are influenced by patients' pre-existing expectations, their interactions with the practitioner, perceived changes in symptoms, perceived chiropractor's competence, and the overall care experience (Yardley et al., 2001). Similarly, the current literature review reveals that the treatment journey potentially leads to both physical changes and psychological changes which are a consequence of the concrete experiences during clinical encounters: patients' abstract representations of the treatment are adjusted accordingly (Yardley et al., 2001). For example, the qualitative component illustrates that the interactions between a chiropractor and a patient may facilitate exercise adherence or change patients' mindset (Stilwell & Harman, 2017b). The qualitative component also shows that patients seek validation that change is indeed occurring throughout the treatment journey. The findings also suggest that this validation is subjective: for example, a symbol of change could be the cracks during spinal manipulation, the gained knowledge, the reduced pain, or the improvement in physical function.

The themes generated by the thematic synthesis of this review are in line with the findings of a concept analysis which explored WA within physiotherapy literature (Søndenå et al., 2020). Authors concluded that the conceptualisation of WA as outlined within their themes share similarities with Bordin's conceptualisation (Søndenå et al., 2020). The themes revealed the importance of the attention which a physiotherapist paid to the patient, the shared therapeutic journey aiming to assist the patient from being dependent to independent, the sense of safety allowing patients to unfold themselves both physically and psychologically, and the role of communication which acted as a catalyst in operationalising the WA in a physiotherapy context (Søndenå et al., 2020). Also, a qualitative systematic review and meta-synthesis investigated patients' and physical therapists' perceptions of factors that impact their mutual relationship (O'Keeffe et al., 2016). The review found four themes which influenced patient-therapist

interactions: (1) physical therapists' interpersonal and communication; (2) physical therapists' practical skills; (3) individualised patient-centred care; and (4) organisational and environmental factors. In correspondence with our findings, the authors noted that patients appreciated a physical therapist with good listening skills and empathetic friendly demeanour. Furthermore, a systematic review of the literature studied the impact of WA in physical therapy for chronic musculoskeletal pain and evidence from three studies suggested that strong WA may improve pain outcomes (Kinney et al., 2020).

The quantitative component of our systematic review included only two studies measuring explicitly WA. Most studies explored adjacent constructs, for example, communication, patient satisfaction, and dimensions of person-centred care. For instance, questionnaires which measured patient satisfaction contain items focusing on contextual factors inherent in WA. Despite that the scales measuring these adjacent constructs include items enquiring about the chiropractor-patient bond, the collaboration on tasks and/or the agreement on goals, they have less explanatory power than a scale specifically designed to measure WA. This review provides some initial evidence for the role of WA within the chiropractic clinical encounter. Research explicitly exploring this construct should measure its direct and mediated effects on clinical outcomes and patient satisfaction. For example, Bishop and colleagues conducted a large prospective cohort study, and their findings emphasised the role of WA and its three features (Bordin, 1979) as a contextual predictor of back-related disability over time in physiotherapy, osteopathy, and acupuncture (Bishop et al., 2021). They suggested that strong WA has the potential to increase patient self-efficacy for coping with pain and to lessen the perceived threat of pain and alleviate psychosocial distress (Bishop et al., 2021). The authors also proposed that it could be useful to develop and then trial post-qualification training for practitioners to enable them to utilise the clinical value of WA in their practice (Bishop et al., 2021). Considering the foundational ideas of chiropractic emphasise the idea that the body is a self-healing mechanism (Palmer, 1958), and the evidentially supported notion that self-healing can be triggered by contextual factors intrinsic to the patient-practitioner relationship, the role of WA in chiropractic consultations should be better understood (Newell et al., 2017; Testa & Rossettini, 2016).

2.5.3 Implications of Findings

The qualitative component illustrates that Bordin's formulation of WA (Bordin, 1979) has the potential to explain the impact of the chiropractor-patient relationship on patient outcomes. The quantitative component shows that even though the construct is relevant to the chiropractic discipline, there is a limited amount of research focused on WA. The findings from this review emphasise the value of measuring the direct and mediated effects of WA between a patient and a chiropractor on patient outcomes. One sensible next step would be to conduct primary research exploring the potential psychosocial pathways through which WA impacts clinical outcomes and patient satisfaction (Yardley et al., 2001).

2.5.4 Strengths and Limitations

This research project synthesised a diverse body of evidence on the topic of WA using data from quantitative, qualitative, and mixed method studies. This type of systematic review provided a nuanced understanding of such a multifaceted phenomenon and was appropriate for the explorative objective of this study. However, there were not enough homogenous studies measuring the impact of WA on patients' satisfaction and clinical outcomes to conduct a meta-analysis. Narrative synthesis provides more limited information for healthcare decision making than meta-analysis (Aromataris & Munn, 2020; McKenzie & Brennan, 2019). Most studies measured WA implicitly using tools designed for other purposes, suggesting the need for more research on the topic in the context of the chiropractic profession. Furthermore, due to the lack of exact definition of the concept of WA in the literature, it is possible that studies exploring the WA between a chiropractor and a patient using conceptualisation different to the one offered by Bordin (Bordin, 1979) were not included in the results. Therefore, given that the search strategy was based on this conceptualisation, it likely influenced the qualitative findings. Nevertheless, the qualitative data informed the thematic synthesis and shaped the generated themes.

2.5.5 Conclusion

WA has been studied to a limited extent within the chiropractic discipline. The nature of WA is best understood if chiropractic care is viewed as a change process in which a patient aims to improve their circumstances by seeking help from their practitioner whose role is that of the

change agent. Strong WA requires ongoing negotiation of treatment goals and expectations alongside collaboration on a mutually agreed upon treatment plan. These processes of negotiation and collaboration are facilitated by, and may in turn strengthen, interpersonal bonds involving trust and mutual respect. Bordin's formulation of WA has the potential to improve our understanding of chiropractor-patient relationships by providing a conceptual framework for thinking about the nature of the therapeutic relationship and how it can impact clinical outcomes through psychosocial pathways. Further primary research is needed to establish the nature, appropriate measurement, and consequences of WA in chiropractic care.

2.6 Author's Note

I spent the first six months of my PhD conducting a preliminary search of the evidence base, which yielded limited results and confirmed the existing gap in research on the alliance in chiropractic care. Exploring such a multifaceted, dynamic phenomenon necessitates a comprehensive method of evidence synthesis, which can produce findings relevant to theory and practice. I developed the review protocol through an iterative process that required carefully selecting objectives, formulating corresponding research questions, and designing an appropriate search strategy to address them. I considered my options and decided to focus either on conducting a scoping review or a mixed methods systematic review. When deciding between the two, it was essential to consider their distinct purposes and applications. While the goal of a scoping review is to identify the available evidence on a topic and to represent this evidence by mapping visually or charting the data, a mixed method systematic review is aimed at addressing specific questions through the synthesis of evidence from qualitative and quantitative research (Munn et al., 2018).

After familiarising myself with the background literature, I decided to employ a mixed methods systematic review methodology, which is also known as a mixed methods research synthesis (Heyvaert et al., 2013), a mixed studies review (Pluye & Hong, 2014), and a mixed research synthesis (Sandelowski et al., 2006). The mixed methods systematic review involves a process of configuration rather than assimilation of findings from qualitative and quantitative research (Sandelowski et al., 2006). The process involves separate quantitative and qualitative syntheses conducted in parallel, followed by integrating quantitative and qualitative data using convergent segregated approach. In line with the CR stance, this approach assumes that the findings from quantitative studies and the quantitative results from mixed methods studies complement the findings from their qualitative counterparts (Lizarondo et al., 2020). The assumption of complementarity stems from the notion that quantitative and qualitative evidence are suited for addressing distinct research questions that pertain to the same construct under investigation. This implies that both types of evidence are concerned with different research objectives, and hence, they cannot be used to confirm or disprove each other but can only supplement each other (Lizarondo et al., 2020). Accordingly, qualitative findings should be synthesised by a method specifically designed for qualitative data, and the same goes for the synthesis of

quantitative findings (Sandelowski et al., 2006). Overall, this methodology allowed the review to address multiple objectives simultaneously, guiding the thesis's primary research.

The systematic literature review employed an explicit and peer-reviewed search strategy outlined in the review's protocol in Prospero, distinguishing it from a scoping review methodology (Munn et al., 2018). Next, the study used thematic synthesis to investigate patients' and chiropractors' perspectives on the nature and role of the alliance, focusing on a clinically meaningful question instead of solely summarising available evidence. This further aligns with the characteristics of a mixed method systematic review as opposed to a scoping review (Munn et al., 2018). The review also evaluated alliance measurement and its impact on treatment outcomes and patient satisfaction, initially planning to use either meta-analysis or narrative synthesis for quantitative synthesis, depending on data homogeneity in the results (Lizarondo et al., 2020). However, the limited number of homogeneous studies hindered the conduct of a meta-analysis, representing a key study limitation. It is important to note that a scoping review could have also effectively addressed this research objective, given its utility in identifying knowledge gaps, clarifying concepts, and investigating research conduct (Munn et al., 2018). Upon reflection, the mixed method review methodology was necessary to address the research question answered by the thematic synthesis, offering insights into the nature and role of WA in the chiropractic profession.

Chapter 3 The Development of Working Alliance in Early Stages of Care from the Perspective of Patients Attending a Chiropractic Teaching Clinic

This chapter has been published as (Ivanova et al., 2024):

Ivanova, D., Newell, D., Field, J., & Bishop, F. L. (2024). The development of working alliance in early stages of care from the perspective of patients attending a chiropractic teaching clinic. *Chiropractic & manual therapies*, *32*(1), 10. https://doi.org/10.1186/s12998-023-00527-8

3.1 Abstract

3.1.1 Background

The clinician-patient relationship has consistently been found to predict treatment success in both physical and mental health settings. This relationship has been operationalised in the literature as "Working Alliance," which consists of three key components: patient-clinician agreement on the goals of care, agreement on the tasks required to achieve those goals, and the establishment of a strong bond. While research has demonstrated the impact of WA in physical health settings, it often measures WA early in patients' care journeys. However, no primary research has investigated how early WA develops between patients and chiropractors. Evidence suggests that musculoskeletal practitioners may require further training to feel confident in establishing WA. Therefore, this study aims to explore the development of WA in the early stages of chiropractic care from the patient's perspective to inform evidence-based practice.

3.1.2 Methods

Participants for this qualitative study were recruited from a teaching clinic at a specialised healthcare professions training university in the UK between September 2022 and April 2023. A total of 25 adult patients completed semi-structured interviews during the early stages of their care. The interview transcripts were analysed using Reflexive Thematic Analysis, from a critical realist stance.

3.1.3 Results

The findings highlight that an early WA entails the gradual development of patients' confidence in their decision to seek help from trainee chiropractors to alleviate their symptoms.

The four themes describe the impact of the clinical context on patients' expectations, the trainee chiropractors' qualities that participants considered important for early WA, the role of explanations, and the interplay between pain and early WA.

3.1.4 Conclusions

Establishing an early trainee chiropractor-patient WA involves a process of building patients' confidence in the trainee chiropractors' expertise, identifying the correct goals of care, and recognising the value of the proposed treatment plan. Factors shaping this process include the context of the care journey, patients' perceptions of trainee chiropractors' qualities, their bodily sensations, their expectations, their past experiences, and their satisfaction with trainee chiropractors' explanations.

3.2 Introduction

The clinician-patient relationship has been consistently reported to predict treatment success, regardless of the type of therapy (Hall et al., 2010; Kelley et al., 2014). For example, a systematic review and meta-analysis of thirteen randomised controlled trials suggested that the relationship between a clinician and a patient has a small, but statistically significant effect on a range of healthcare outcomes, such as health-related quality of life, weight loss, blood pressure, pain relief, and smoking quit rate (Kelley et al., 2014). This clinician-patient relationship has been operationalised in the literature by a construct called *"Working Alliance"*. Bordin developed the most comprehensive WA theory in a mental health context, but his conceptualisation is considered applicable to diverse therapies and settings, including physical health (Bordin, 1979, 1994; Elvins & Green, 2008). Bordin's conceptualisation is designed to account for how the theory underlying a given therapy translates into a clinical change process during which the patient and the clinician work together collaboratively to reach the desired treatment outcome (Bordin, 1979, 1994). According to Bordin, WA has three key features: (1) agreement on the goals of treatment; (2) agreement on the tasks required to achieve the goals; and (3) establishment of a bond (Bordin, 1979, 1994). The bond does not simply reflect the overall level of rapport or respect, it also embraces the mutual trust and patients' confidence in the treatment process (Bordin, 1979, 1994; Elvins & Green, 2008).

Findings demonstrating the association between WA and subsequent psychotherapy outcomes are robust (Flückiger et al., 2018). The impact of the strength of WA on outcomes is also well-documented in physical health settings (Hall et al., 2010) where WA is often measured early in treatment. For instance, a recent study found that patients' rating of WA was a positive predictor of improvement in region specific outcome measures in patients receiving physical therapy for acute and chronic musculoskeletal pain conditions (Holmes et al., 2023). Holmes and colleagues measured WA before the third treatment session; first to ensure enough time for WA to develop and second to minimise the impact of other factors (Holmes et al., 2023). Similarly, Bishop and colleagues conducted a prospective cohort study measuring WA during the second week of treatment (Bishop et al., 2021). They found that stronger WA on all three features (bond, tasks, and goals) was a statistically significant predictor of reduced back-related disability over time in patients attending physiotherapy, osteopathy, and acupuncture clinics (Bishop et al.,

2021). The impact of WA on outcomes did not differ across the three different therapies in the private and public sectors (Bishop et al., 2021).

A systematic literature review concluded that patient-rated WA during treatment predicted pain reduction and improvement in physical functioning for patients with chronic musculoskeletal pain based on four cohort studies and one randomised control trial (Lakke & Meerman, 2016). The cohort studies measured WA during the treatment intervention (e.g., during spinal manipulative therapy) (Lakke & Meerman, 2016). The randomised control trial tested the effects on pain intensity and muscle pain sensitivity of WA as an active intervention added to interferential therapy (Fuentes et al., 2014). In the control group therapists were instructed to avoid conversation during the inferential therapy treatment; in the intervention group therapists were instructed to improve WA during inferential treatment by maintaining eye contact, physical touch, offering words of encouragement, using phrases that show empathy, and asking questions to demonstrate active listening (Fuentes et al., 2014). The results from the trial suggested that WA impacted pain intensity, but not muscle pain sensitivity (Fuentes et al., 2014). Returning to the findings from the systematic literature review, the influence of WA on treatment outcomes was small but significant: the cohort studies indicated that WA contributed to pain reduction and physical functioning measured by means of questionnaires (Lakke & Meerman, 2016).

While most systematic literature reviews in this area assess the impact of WA on outcomes, Kinney and colleagues included studies that explored factors influencing the strength of WA (Kinney et al., 2020). Three qualitative studies used semi-structured interviews to study factors that have positive impact on the strength of WA and one quantitative observational study explored factors that have a negative impact (Kinney et al., 2020). Examples of factors that could have positive impact were 1) a therapist working with the whole person, 2) a therapist seen as more than just a professional, 3) an individualised, flexible treatment plan, 4) the ability to work through challenges in the patient-clinician relationship, 5) rapport, 6) a trusting relationship, 7) the identification of patient values, 8) the identification of patient barriers, 9) open communication, and 10) a therapist perceived as having the patient's best interest in mind (Kinney et al., 2020). In contrast, factors that could have a negative impact on WA according to the patients' perspective were hostility and anger expression, and high anger expression combined with high depression according to the clinicians' perspective (Kinney et al., 2020).

Given the effect of WA on health and other outcomes, researchers should aim to understand how it develops. Like most relationships, establishing WA is almost certainly a dynamic process (Bordin, 1994; Muran & Barber, 2011). In physical health settings, the literature on the development of WA is scarce (Babatunde et al., 2017; Horton et al., 2021). One study used a cross-case analysis to compare experiences of WA between occupational therapists and clients across four therapeutic dyads (Morrison & Smith, 2013). The qualitative data suggested that WA was shaped by the fostering of an interpersonal connection, a shared sense of success, and the attainment of clearly defined, patient-centred goals. These findings demonstrated the applicability of Bordin's conceptualisation of WA in the study context (Morrison & Smith, 2013). However, the study characteristics - a small sample of four dyads with two community-based occupational therapies and two patients – may limit the transferability of findings to other contexts (Morrison & Smith, 2013).

A mixed method study investigated 1) how physical therapist behaviours and interactions during the initial physical therapy assessment relate to the patient's perception of WA and 2) the relationship between WA, pain intensity, and function (Myers et al., 2022). Mayers and colleagues used 1) qualitative analysis to develop a checklist of WA themes and behavioural practices and 2) Spearman's Rho (ρ) to quantify if there was an association between increased WA and improved clinical outcomes (Myers et al., 2022). Patient-rated WA was stronger when the physical therapists used information gathering, paused to listen, used humour and transitions, and used clarifying questions (Myers et al., 2022). Patient-rated WA was weaker when the following behavioural practices were present: lack of touch, the absence of pain neuroscience education, and not restating what the patient had said during the interview (Myers et al., 2022). The study findings demonstrated a statistically significant negative correlation between patient-rated WA and pain intensity immediately after the initial evaluation, highlighting the relationship between early WA and clinical outcomes (Myers et al., 2022).

Most patients who seek chiropractic care do so for predominantly musculoskeletal conditions (Beliveau et al., 2017). Chiropractors use a range of techniques such as hands-on manipulation of the spine, ice, heat, ultrasound, exercise, acupuncture, and advice about posture and lifestyle. The qualitative component of a recent mixed methods systematic review found that both patients and chiropractors consider the features of WA to be crucial factors during care (Ivanova et al., 2022). Jamison was the first to study chiropractor-patient WA: she explored the interplay between the established WA and patients' expectations (Jamison, 1996). Findings from her mixed method study suggested that WA included a sense of congruence, an

interpersonal bond, positive expectations, identification of shared goals, and a sense of collaboration (Jamison, 1996). However, that study is now over 25 years old. Moreover, the question of how WA develops during the initial stages of chiropractic care remains unclear despite most studies measuring WA in this period.

A recent modified two-round online Delphi-consensus survey was conducted with musculoskeletal practitioners to measure the extent of panel agreement on the perceived acceptability and influence of five main types of contextual factors during clinical management of patients with chronic LBP (Sherriff et al., 2023). The contextual factors of interest were 1) the patient-practitioner relationship; 2) patient's characteristics/beliefs; 3) practitioner's characteristics/beliefs; 4) the treatment characteristics; and 5) the treatment environment/setting. The panel consisted of 23 chiropractors, 10 physiotherapists, one individual who was a qualified chiropractor and physiotherapist, and one clinical functional neurologist. The findings suggest that the patient-practitioner relationship was rated as the most important contextual factor. However, less than 70% of the panel reported being confident about their non-verbal communication skills and less than 70% of the panellists were confident about developing WA, expressing genuine empathy, engaging in collaborative decision-making, or requesting the patient's opinion. Conclusions from the study suggest that musculoskeletal practitioners may require further training to increase their confidence in applying essential psychosocial skills to address the complex needs of patients with chronic LBP (Sherriff et al., 2023).

Even though recent research suggests WA is 1) a key predictor of outcomes in patients with LBP (Bishop et al., 2021) and 2) is identified by a consensus of chiropractors as a central factor in the delivery of chiropractic care (Sherriff et al., 2023), such psychosocial content is not a strong focus in either the historical identity of the profession or within existing chiropractic curricula (Gliedt et al., 2020). This qualitative study explored patients' perceptions of the initial development of WA during the early stages of chiropractic care in the context of a teaching clinic. The study aimed to understand how early WA develops between patients and trainee chiropractors to inform evidence-based practice and facilitate training development on the patient-practitioner relationship. Anecdotally, trainee chiropractors typically spend more time with patients than qualified chiropractors, especially during the initial assessment. This provides an opportunity for the establishment of WA early in the care journey, thus allowing the researchers to explore early WA development from patient's perspective. In addition, because a diverse and large number of trainees see patients at the teaching clinic at any one time, this

facilitated a systematic exploration of WA across multiple trainee chiropractors; such a breadth of sampling would have been difficult to achieve if we had worked with qualified chiropractors (who in the UK mainly work in single-handed or small practices) (Cameron, 2021). Finally, the subsidisation of fees in a teaching clinic meant we were able to examine WA in the context of a more diverse patient population.

3.3 Methodology

3.3.1 Design

This qualitative study explored patients' perspectives on the formation of a relationship between themselves and trainee chiropractors early in the care journey. The study was approved by the Faculty Ethics Committee at the University of Southampton (Number: 74271). The study was conducted in the teaching clinics at AECCUC, which is a specialist health care professions training university in the UK ("AECC University College," 2023). In this setting, health care trainees work under the supervision of qualified academic clinicians. The qualitative methodology used in this study gave patients voice by allowing the researcher to explore their interpretation of the development of WA (Willig, 2013). The use of semi-structured interviews addressed patients' perspectives on the complexity underlying the formation of WA, which in turn may inform an in-depth understanding of how early WA can influence outcomes (Muran & Barber, 2011).

The researchers considered and discussed their stance on ontology (the nature of reality), epistemology (our knowledge of reality) and the implications of such assumptions on the study and its findings (Willig, 2012). The philosophical stance chosen to underpin the study was CR (Bhaskar, 2013). Ontologically, CR assumes that the nature of reality is not reducible to our knowledge of it; in other words, an external reality exists, and it is independent of our perception of it (Bhaskar, 2013). According to CR, there is a difference between experiences (how patients interpret their relationship with the chiropractor), events (the development of a relationship during care), and causal tendencies (factors that impact the formation of a relationship) (Bhaskar, 2013; Wiltshire & Ronkainen, 2021). Generally, patients' perceptions of WA are highly subjective experiences comprised of emotional and cognitive dimensions that include appraisals of clinicians' intentions and the perceived value of treatment (Muran & Barber, 2011). From a critical realist standpoint, patients may not necessarily be fully aware of the causal

tendencies or conditions underlying the formation of WA with chiropractors. Instead, qualitative interviews provide insight into patients' interpretations of their experiences (Bhaskar, 2013; Wiltshire & Ronkainen, 2021). To understand how WA develops, the researcher further considered the context in which the study was conducted and drew on their knowledge of psychological theories and evidence to account for the findings.

3.3.2 Participants

Participants were recruited from a patient pool enrolled in an online longitudinal questionnaire at AECCUC study via availability sampling during September 2022 and April 2023. For the purpose of this study, the AECCUC was sometimes also referred to as *"the college"*, because participants used this term to refer to the AECCUC. The inclusion criteria for patients were as follows: 1) adult (at least 18 years) seeking chiropractic care at the AECCUC teaching clinic; 2) receiving treatment from a chiropractic student trainee who will be available for the whole duration of treatment; and 3) has not visited AECCUC in the last one year. The purpose of Criterion 3 was to ensure that a potential participant would be working with a trainee for the first time so that the formation of WA could be studied from the beginning. The exclusion criteria were as follows: 1) patients lacking full mental capacity, and 2) inability to complete questionnaires and interview in English. Pain duration and severity, co-morbidities and co-treatments were recorded to describe the sample.

The authors discussed in advance the use of saturation in the context of Reflexive Thematic Analysis (RTA), which is the method of data analysis used in this study (Clarke & Braun, 2021). Braun and Clarke, the scholars who developed Reflexive Thematic Analysis, contend that concepts such as data saturation, thematic saturation, code saturation, and even meaning saturation are not in line with the values and assumptions of RTA (Braun & Clarke, 2021). We followed the model developed by Malterud and colleagues to guide the sample size of the study (Malterud et al., 2016). According to the model, the more information relevant to the research aim a sample holds, the smaller number of participants is required (Malterud et al., 2016). The sample size depends on the following elements of information: 1) the aim of the study, 2) sample specificity, 3) use of established theory, 4) quality dialogue, and 5) analysis strategy (Malterud et al., 2016). On one hand, the study aim was based on established theory, which reduced the required sample size. On the other hand, there were four interviews which lasted around 10 minutes, which did not allow for a high-quality dialogue between interviewer and participants, thus increasing the required sample size. Considering further the aim of the study,

the sample specificity, and the analysis strategy, we agreed that a sample of 25 participants provided sufficient information power to explore early WA development between patients and trainee chiropractors.

A total of 53 patients from the pool of 71 participants in the longitudinal questionnaire study gave consent to be contacted regarding the qualitative study. Out of the 53 patients, a total of 25 participants (12 females and 13 males) took part in the qualitative study and completed an interview. The majority were English, Welsh, Scottish, Northern Irish, or British (*n* = 22); the remaining three participants were White Asian, Spanish, and French. Twelve patients had never received chiropractic care before, five had received chiropractic care at AECCUC more than a year ago, and eight had received chiropractic care in a different clinic. The main reasons for visiting the AECCUC were back pain (*n* = 11), shoulder pain (*n* = 6), neck pain (*n* = 3), knee pain (*n* = 2), general wellness (*n* = 2) and unspecified (*n* = 1). The median age of the group was 55. Twenty-one participants experienced pain with a median score of 6 on a 10-point numerical rating scale (Table 3.1). Five participants had chronic conditions; three of them said that their condition limited their activities.

Table 3.1 Age and Pain Severity

	N	Minimum	Maximum	Median
Severity of pain	21	2.0	9.6	6
Age	25	24	78	55

3.3.3 Semi-Structured Interviews

On enrolling in a longitudinal questionnaire study, patients were asked if they would be interested in taking part in this qualitative study. Patients who expressed interest in the qualitative study were invited to participate in one semi-structured interview early in participants' care. Interviews were conducted by the first author (DI) who is a female PhD researcher in Psychology at the University of Southampton with MSc in Social Research Methods. The interviewer had no established relationship with the participants prior to study commencement. The interviews lasted between 10 and 40 minutes with an average duration of 23 minutes. They were conducted synchronously without cameras on a one-to-one basis via Microsoft Teams software (version 1.5.00.28361) (Microsoft Teams software 2022) and were

audio-recorded with participants' informed consent. They consisted of open-ended questions, thereby allowing participants to share their experiences: starting with broad questions about patients' experiences, followed by specific questions about their expectations and their perception of collaboration, communication, and a potential bond between them and the trainee chiropractor. The topic guide (Table 5.8) was developed by DI under the supervision of the co-authors and was informed by Bordin's conceptualisation of WA and the findings of a published systematic literature review exploring the nature of WA in the chiropractic profession (Bordin, 1979; Ivanova et al., 2022). The interview guide was pilot tested with one individual, who was not a participant in the study.

3.3.4 Data Analysis

Interviews were transcribed verbatim using the transcripts provided by Microsoft Teams as a starting point and then and checked for accuracy. The interview transcripts were analysed by using RTA (Clarke et al., 2015) in NVivo (Version 12) (NVivo, 2018). This qualitative method involves a reflexive engagement with the data and follows a six-phase recursive process. It emphasises both accurate reflection of the qualitative data and the active role of the researcher in the knowledge production process (Braun & Clarke, 2019; Clarke & Braun, 2021). RTA was used because the method acknowledges the role of the researcher's subjectivity as a resource, thereby enabling interpretation of patients' experiences in relation to available literature and the study context (Braun & Clarke, 2019; Clarke & Braun, 2021). The six phases of RTA outlined by Braun and Clarke follow a sequential order but involve moving back and forth between phases (Clarke & Braun, 2021).

The first two phases included familiarisation with the dataset and coding (Clarke & Braun, 2021). The researcher (DI) read and reread the transcripts, saving initial analytic insights as memos and annotations (Clarke & Braun, 2021). During coding, semantic, and latent codes were generated using inductive and deductive orientations, respectively (Clarke & Braun, 2021). In the former, the analytic process started from the data itself (Wiltshire & Ronkainen, 2021). In the latter, the researcher (DI) approached the data with preconceived ideas and concepts that reflected the study context and relevant theory, including social cognitive theory and Bordin's theory of WA (Bandura & Walters, 1977; Bordin, 1979; Clarke & Braun, 2021; Wiltshire & Ronkainen, 2021). The next two phases included the generation, development, and revision of themes (Clarke & Braun, 2021). After DI generated the initial themes, FLB, DN, and JF participated in the last three phases of the reflexive thematic analysis, which included

developing and reviewing, defining, and naming the themes, and finally, the production of the report. FLB is a Professor of Health Psychology with extensive experience in qualitative research. DN is a Professor of Integrated Musculoskeletal Care with extensive experience in the chiropractic profession. JF is a highly experienced Chiropractic Clinician with a PhD from the University of Portsmouth. A critical realist approach to RTA translated the philosophical stance into methodological practice by using three types of themes: experiential, inferential, and dispositional themes (Wiltshire & Ronkainen, 2021). The experiential themes were data-driven and referred to participants' subjective viewpoints, describing their experiences, feelings, hopes and concerns. For each new transcript, deductive thinking was used to check the recurrence of themes and to look for new data-driven themes. The process involved monitoring whether experiential themes were adequately supported by data (empirical adequacy), accurately describing factual information (descriptive validity), and closely representing participants' experiences (interpretive validity) (Wiltshire & Ronkainen, 2021). Inferential themes were derived from the experiential themes and included the researchers' inferences and conceptual redescriptions of participants' experiences. Consideration was given to whether inductive and abductive claims could reasonably be considered as plausible reflections of what occurred in the world (ontological plausibility) and whether interpretive validity was lost in abductive claims (Wiltshire & Ronkainen, 2021). Finally, the dispositional themes were derived from the inferential themes and reflected theories about potential causal tendencies underlying the formation of early WA. Retroductive thinking was employed by theories postulating the properties that had to exist in order to produce the phenomena being studied. Consideration was given to whether retroductive claims had a sound logical basis (judgemental rationality) and the extent to which they accounted for what the analysis had so far revealed (explanatory power) (Wiltshire & Ronkainen, 2021). During the final phase, the production of the report, the researchers continued referring to the research question, the lists of codes, and the theme definitions to ensure that the finalised dispositional four themes addressed the research aims comprehensively (Wiltshire & Ronkainen, 2021). The participants did not provide feedback on the finalised themes.

3.4 Results

The first step of early WA development involves a process of building participants' confidence in their choice to put their health in the hands of the trainee chiropractor. The following quote from Participant 8 can be mapped to the three features of WA and suggests that at the start of care,

the participant wanted to feel confident in the expertise of the trainee chiropractor before developing a bond with them. To reach agreement on the goals of care and the proposed plan, the participant also wanted to feel confident that their treatment was appropriate and designed to deal with a correctly identified problem.

> *I need to know that they know what they're doing. They know what they're talking about. And I've got to be in a situation where I believe that what they've told me is the answer to the problem, and not that they're just having a good guess. So, I need to be convinced that what they've said needs to be done is actually what needs to be done.*
>
> **(Participant 8)**

Generally, at the start of the chiropractor-patient relationship, participants wanted trainee chiropractors to make them feel confident in the upcoming care journey. The four themes reveal the factors that impacted the extent to which participants felt confident and thus shaped early WA. Table 3.2 provides a summary of the themes and their key attributes.

Table 3.2 Themes - Summary and Key Attributes

Theme Name	Key Attributes
The Context of the Clinic: Setting up the Conditions for the Process of Building Patients' Confidence in the Upcoming Care Journey (p. 106)	The role of the clinic's reputation and others' recommendations in participants' openness to initiating a working alliance. The role of the thorough assessment. The role of tutors' supervision.
Key Chiropractors' Qualities: Confidence and Perceived Expertise in the Context of Early Working Alliance (p. 107)	Trainee chiropractors' self-confidence. Trainee chiropractors' perceived expertise. The impact of patients' sense of touch on their perception of trainee chiropractors' key qualities.
The Role of Explanations in the Development of Working Alliance (p. 110)	The role of trainee chiropractors' explanations in the process of establishing agreement on treatment goals and plans. The role of trainee chiropractors' explanations in the process of establishing a bond, consisting of trust, confidence and mutual understanding. The potential role of trainee chiropractors' explanations in patients' adherence to the treatment plan. Active listening and clear explanations as tools to amend differences in opinions.

Theme Name	Key Attributes
Working Alliance in the Context of Pain (p. 112)	Participants describe a sense of vulnerability during chiropractic care. The importance of active listening and the established bond in the context of patients' experience of chronic pain. Patients' experience of pain in the context of treatment goals. The importance of trainee chiropractor-patient agreement in the context of potentially painful situations.

3.4.1 Theme: The Context of the Clinic: Setting up the Conditions to Build Patients' Confidence in the Upcoming Care Journey

> *The attitude of AECCUC is that they don't want to see you forever. So, it's not just about managing the pain, or fixing the problem. It's about the long-term journey, how do you then maintain the issue, and not just fix it. How do we fix it and then maintain it, so that's important.*
>
> **(Participant 10)**

A shared belief across most participants was that the AECCUC is a well-respected institution in the locality and region that would provide them with high quality care. This theme captures four key ways in which the context of the clinic shaped early WA development.

First, participants shared that their expectations were raised because of the people they had spoken to or the success of their previous visits. An existing positive opinion can make patients more inclined to trust the trainee chiropractor and, thus, more open to initiating WA. In contrast, Participant 7, who had a previous negative experience at AECCUC, shared that the initial trust towards the trainee chiropractor was *"about 60%"*, but they expected this to grow with time.

Second, most participants noted having a thorough assessment, which is standard practice during the first visit at the clinic and typically lasts two hours. For example, the thoroughness of the assessment left Participant 10 with the impression that the attitude of AECCUC was *"a lot more personal"* compared to other qualified chiropractors, who can be *"one in, one out"*. This two-hour assessment gave participants a sense of reassurance, which had a positive impact on

the process of building their confidence. Arguably, the time spent examining potential causes of their symptoms convinced participants that the proposed treatment would be appropriate. Furthermore, some participants explained that while going through the assessment, the trainee chiropractors demonstrated their background knowledge, which increased participants' confidence in the trainee chiropractor. For example, Participant 19 explained that the initial assessment was *"the platform from which the confidence initially was very well established but then built on and maintained"*.

Third, most participants acknowledged that the trainee chiropractors at AECCUC were still in the process of learning. As a result, participants adjusted their expectations, and in some cases, they even empathised with their trainee chiropractor. This was mainly evident in participants' acknowledgement that the trainee chiropractors may lack self-confidence and display some nervousness, but this did not impact their impression of the trainee chiropractors' capabilities. Interestingly, Participant 7 reflected on a past experience at AECCUC, emphasising that they should have escalated a problem to the tutor. They further explained that they did not do so because they did not want to *"get the trainee chiropractor in trouble."*

Finally, most participants described expecting that the trainee chiropractor should discuss everything with a tutor. Participants wanted to know that the trainee chiropractor and the tutor agreed on the treatment plan. It could be argued that participants' knowledge of the role of tutors' supervision was crucial in the process of building their confidence in the upcoming care journey. In summary, the context of the clinic helped to shape early WA development. The next theme explores which of the trainee chiropractors' qualities the participants considered important for early WA.

3.4.2 Theme: Key Chiropractor Qualities: Confidence and Perceived Expertise in the Context of Early Working Alliance

Early WA included a process of building patients' confidence in the expertise of the trainee chiropractor. Interestingly, participants deemed self-confidence to be one of the most important qualities of a good chiropractor. Overall, the interviews indicated that when trainee chiropractors show self-confidence, this self-confidence could make participants feel more confident in their expertise. Participant 9 explained that healthcare professionals should have *"some kind of a pleasant authority, where they command the respect and confidence of the*

patient". According to the participant, self-confidence was evident in the style of communication:

> *It's absolutely about communication…the combination of service, assertiveness, arrogance in the nicest possible way. In other words, "I know what I'm doing" kind of attitude, you know, "I'm telling you, *patient's name*, this is what you need to do." That kind of thing. You know, we all need that at some times*.
>
> **(Participant 9)**

While some trainee chiropractors were more self-confident than others, participants took into account that the trainee chiropractors were still in the process of learning. Overconfidence was viewed unfavourably. The following quote illustrates the impact of the clinical context on patients' expectations about chiropractors' self-confidence:

> *I just felt completely trusting in and everything that they did. It's something I don't think you could quantify it. If he was nervous, it didn't really show and they came across as confident but also not overconfident, I think that that would be in that situation, just as bad, if someone became brash and instantly said to me "oh, we know exactly what the problem is, come back and we'll fix it." That actually wouldn't have made me confident. But the feedback and the understanding of seeing all those copious notes taken and then the fact that summary is going to be given and a plan…. that's what's given me the confidence that it will be sorted and it's well worth I made the right decision to go there.*
>
> **(Participant 6)**

Furthermore, when trainee chiropractors display self-confidence, they can help patients feel less tense, potentially facilitating manual intervention. For example, Participant 7 reflected on their expectations: *"I suppose they (trainee chiropractors) need to feel relaxed enough with the patient, sometimes if you're very tense and you talk to somebody you, you show that you tense and make them tense as well."* Participant 7 explained in more detail what they felt was important to get along with their trainee chiropractor: *"I would say confidence. Ability to put me at ease… Someone who looks like they know what they're doing. You know, you can know what you're doing, but knowing it and having the confidence at the same time"* (Participant 7). Similarly, Participant 5 clarified: *"if you haven't got good working relationship and people are trying to manipulate you, you're probably already a little bit but more rigid to begin with"*.

Interestingly, participants assessed trainee chiropractors' self-confidence by considering their own sense of touch. Participant 24 compared the touch of the trainee with the touch of the tutor during the examination. While the former was *"a little bit more tentative"*, the latter *"just went straight in – very confident, very firm"*. Similarly, Participant 22 shared that they wanted their trainee chiropractor to be less gentle: *"If I don't feel the pain, I feel that the treatment is not enough"*. We argue that the more self-confident the trainee chiropractor was, the more convinced the patient was of their expertise. The following quote suggests that a participant may feel confident in the chiropractors' expertise simply based on the degree of self-confidence perceived, independently of their actual knowledge and skills:

> *I never had the same confidence that he was going to work. His predecessor managed to exude confidence. Certainly, that the chap I'm seeing now, he seems to be the same. It's a bit like the captain of the aeroplane you're flying on, the doctor at the surgery you have, we are brought up to have complete faith in these people. And only when the plane crashes, we realised we were wrong, but you know.*
>
> **(Participant 9)**

In addition to noticing trainee chiropractors' self-confidence, participants also judged their expertise in the early stages of developing WA. When asked about their first impression of the trainee chiropractor, most participants referred to their perception of the trainee chiropractor's knowledge and skills. The phrase *"seemed to know what they were doing"* in the context of trainee chiropractors' perceived expertise was quite common across the interviews. Participant 1 said that they respected the trainee chiropractor because of their perceived expertise: *"I've got respect for him because he knows what he's doing"*. Similarly, Participant 24 wanted to be feel confident that, indeed, the trainee chiropractor would know what they were supposed to do: *"it's an expectation that they are the professional so you come to them for help … I'd like to feel that they know what they're doing"*. Similar to perceived self-confidence, a trainee chiropractor's perceived expertise may impact the extent to which patients physically relax during manual intervention.

Participants' interpretation was that the tenderness during palpation suggested that the trainee chiropractor knows what they are doing. Participant 7 described how the trainee chiropractor was trying to reproduce the pain during examination based on what the participant had shared. In this case, the elicited tenderness demonstrated to them that the trainee chiropractor understood them correctly. Likewise, Participant 8 shared how their trainee chiropractor

explained the notion of referred pain: *"She was able to poke one side and make it hurt on the other side, which wasn't something that I encountered. And it made me realise that, obviously, she knew what she was talking about"*. This theme focused on one aspect of early WA development – building patients' confidence in the trainee chiropractors' expertise. Another aspect of early WA is discussed in more detail in the next theme.

3.4.3 Theme: The Role of Explanations in the Development of Working Alliance

Generally, explanations were the key factor impacting the process of early WA development and they appeared to do this in four main ways. First, explanations fostered trainee chiropractor-patient agreement on the goals of care and collaboration on the treatment plan through negotiation. For example, when Participant 6 was asked about factors that could help them feel involved in the decision-making process during care, they noted the role of explanations:

> *I think if they explain clearly what it is we need to do and perhaps what is a likely cause of the problem, I think they could then explain to me the causes and then what can be done not only from their point of view in terms of manipulation or whatever they do, but they can then explain the need for me to do certain things. And maybe I've been doing something for a long time which builds up and causes the problem. Then it would be the case of them explaining to me clearly what's the problem and I'm sure we can then openly talk. And then I can realise: "Oh yes, I've been doing that" or "I've always been sitting in a certain way".*
>
> **(Participant 6)**

Second, explanations can enable patients to relate to and bond with the trainee chiropractor by helping them understand the trainee chiropractor's thinking behind the proposed treatment plan. This in turn can build patients' confidence in the upcoming care journey. For example, Participant 8 reflected on the need for satisfactory explanations:

> *I would need to feel comfortable having spoken at length about it, having been tended to by the student. Then the student having gone away and thought about it and discussed it with a tutor has come back and said: "Well the answer is that and that and what we need to do is this this and this". I'm very comfortable. But I would be a bit concerned if I thought: "Well, that did not make any sense to me". In this case I'm very convinced that she's got the answer.*

Participant 8

Similarly, referring to the development of a trainee chiropractor-patient bond, Participant 7 shared that if a trainee chiropractor did not explain to them what they wanted and did not help them find the way to achieve what they needed to achieve, they would lose trust. Participant 5 noted that *"if you don't trust your chiropractor, you're not really going to be invested in what they're trying to do and what they're thinking. I think on a more formal aspect, if you have a good working relationship you're more inclined to follow the instructions they've given you, if they're giving you rehabilitation at home"*. On one hand, satisfactory explanations could impact the development of mutual trust, and on the other hand, the established trust increased participants' receptiveness to the explanations provided by the trainee chiropractors.

Third, explanations enabled appropriate adherence to the treatment plan and may potentially facilitate recommended lifestyle changes. For instance, Participant 10 shared that they wanted a chiropractor to demonstrate how to do an exercise, and then observe them doing it to ensure that it was done properly. This *"feedback loop"*, as Participant 10 described, can help patients feel reassured that they know how to follow the treatment plan correctly. Chiropractors' explanations could help patients learn new insights about their body, which in some cases led to the immediate implementation of a lifestyle change. In the context of lifestyle changes, Participant 11 explained *"I'm clear there's a lot of patience from the practitioner because I am quite interested in this type of thing, chiropractic care and how it works and just to aid myself as well, because, of course, my practitioner is treating, but I got the lifestyle changes to adjust, perhaps, if required."* Explanations can help patients to understand how to implement potential changes in their life and follow the recommended treatment plan.

Fourth, explanations can be used as a tool to amend differences in opinions. For instance, Participant 4 and their trainee chiropractor had a different interpretation of the participant's blood pressure score. For the trainee chiropractor, the score was healthy for the patient's age, but for the participant, the score was high compared to their normal range. Participant 4 noted that *"the conversation needs to be flowing and you need to feel that you are the expert of how you feel about something and your experience of it"*. In cases where the trainee chiropractor and the patient have a mismatch in their interpretations of a situation, explanations can potentially help both sides clarify any misunderstanding. The importance of explanations did not only concern the explanations provided by the trainee chiropractors. Participants wanted to feel that their own explanations were being listened to, considered, and validated, particularly in

potentially vulnerable or painful situations. The next theme explores the role of patients' pain in early WA development.

3.4.4 Theme: Working Alliance in the Context of Pain

As discussed, early WA development included a process of building patients' confidence in: 1) the expertise and trustworthiness of the chiropractor, 2) the correctly identified problem causing patients' symptoms and 3) the appropriateness of the proposed treatment plan. The importance of the three features of WA was especially evident in the context of pain.

The interviews revealed that participants can experience a sense of vulnerability during chiropractic care, which increased the need for established WA, especially in potentially painful situations. For example, Participant 5 noted the role of trust when a patient is in a vulnerable position: *"I think you (a trainee chiropractor) have to have good communication skills, especially with the more vulnerable people... they are putting their health in your hands really, especially when they're using manipulation, chiropractors have the ability to cause harm so there has to be that element of trust. Putting people at ease is probably a big part of that"*. Participant 12 reflected further on the role of WA in cases when a patient feels stressed: *"I think when you're under a bit of stress in those sort of situations, you just need to feel comfortable, which I do...I trust what she's trying to achieve and it's all being done with the right goals at the end"*. Participant 16 also explained: *"I think when somebody sort of working on your body anyway, I think it's important to feel comfortable. If you don't get along with somebody, I think it can be quite uncomfortable having that closeness with somebody."* This theme explores the interplay between WA and participants' experience of pain and vulnerability.

First, Participant 22 shared their thoughts on their chronic pain, illustrating the importance of the established bond, capturing patients' confidence in trainee chiropractors' expertise and trustworthiness:

> *With my chiropractor, I was so relaxed because I knew I could trust her with whatever she was going to do with my body, because she gave me that trust right from the assessment. Now, if someone was rough on the assessment and wanted to move on to one question to another to another... you don't want to listen to me and my pain, my chronic pain, because they are real pains.... I'm not going for a treatment just for someone to get some money out of me.*

(Participant 22)

Participant 22 wanted to feel that the trainees truly cared about them and their pain. Generally, participants wanted to feel validated in the context of their experience of pain. This is where the role of active listening was most crucial. For example, Participant 7 commented further on what would make them lose trust in the trainee chiropractor: *"If they're not validating what I'm saying. If they're not listening, if I'm saying that I'm in pain or it doesn't work, or I can't do it, or I don't feel the stretch or it doesn't do anything for my muscles"*. Some participants highlighted that they needed to trust the trainee chiropractor to let them relieve their pain. They realised that the established trust could have both psychological and physiological impacts. Participants acknowledged that the more they trusted the trainee chiropractor, the more comfortable they felt during manual intervention (psychological impact). Additionally, the more relaxed their body was during manual intervention, the more they could get out of it, because their body was less tense (physiological impact).

Second, pain played a role in the process of identifying the problem, which the proposed treatment plan was supposed to address. The participants revealed that sharing about and describing their pain can be challenging. For instance, Participant 20 shared that it was difficult to accurately explain the sensation in their body; thus, they felt that the trainee chiropractor did not understand them completely. This can impact the mutual agreement on treatment goals. In contrast, Participant 7 explained how they could not make sense of the pain in their body until the trainee chiropractor validated their experience by providing a physiological explanation.

Third, participants valued the mutual agreement on the proposed treatment plan. They wanted to feel confident in the trainee chiropractors' readiness to be receptive of their needs, demonstrating empathy and patience. For example, Participant 7 explained: *"If I'm saying I can't do that because it hurts too much, or I could do it but it hurts too much the next day, then I want them to take that into consideration."* The discomfort of patients' pain may amplify the need for establishing WA, especially in regard to reaching an agreement on how to alleviate their symptoms. Participant 11 described how their trainee chiropractor engaged in an ongoing negotiation with them in a potentially painful situation:

> *She's always asking me to let her know about my pain between one and ten. So when she's prodding, for example, and I'm communicating. So we have this open dialogue, so if I say two, two is fine, it's totally manageable. But if I was someone had more pain, then that could be very important because you tense as well, don't you, when you think*

something is going to hurt. And of course, to get the best out of the whole treatment, you've got to be relaxed, really. And that could be a difficult thing if you don't have confidence in your practitioner.

Participant 11

Overall, participants' experience of pain and the related sense of vulnerability 1) amplified the need for established confidence in the trainee chiropractors' trustworthiness and expertise, 2) shaped the process of establishing agreement on treatment goals, and 3) emphasised the need for trainee chiropractors' receptiveness to participants' feedback on the treatment plan.

3.5 Discussion

3.5.1 Summary of Findings

The results from the thematic analysis illustrated the development of chiropractor-patient WA from the perspective of 25 participants in the initial stages of their care with trainee chiropractors. The findings emphasised that, at the start of care, WA involved a process of building participants' confidence in their choice to seek trainee chiropractor's help to alleviate their symptoms. When assessing their own level of confidence in the upcoming care journey, participants considered the recommendations from trusted others, the thorough assessment in the clinic, and the reassurance that tutors and trainees agree on the proposed treatment. Additionally, they referred to their bodily sensations, their perception of the trainee chiropractors' self-confidence and expertise, and the provided explanations. Reflecting on the described sense of vulnerability related to chiropractic care, participants emphasised that trainee chiropractors should validate their experience of pain by listening to and considering their needs, explanations, concerns, and preferences. The four themes described 1) the impact of the clinic on participants' expectations, 2) the trainee chiropractors' qualities that participants considered important, 3) the role of explanations, and 4) WA importance in the context of pain. The next sections will discuss how the themes relate to the wider literature.

The participants in this study were recruited from a patient pool at the teaching clinic set in a specialist health care professions training university in the UK. The context of the clinic impacted early WA development in the following ways. First, the university was a well-respected institution in the locality and region. This contributed to participants' positive expectations which were partly based on the reputation of the clinic. Second, while the interviews suggested

that trainee chiropractors' self-confidence can play a role in early WA development, participants acknowledged that the trainee chiropractors were still in the process of learning. Thus, participants adjusted their expectations accordingly, accepting that the trainee chiropractors may show some nervousness. However, our findings further demonstrated the importance of recommendations from trusted others, patients' perception of the trainee chiropractor's self-confidence and expertise, and the role of explanations. These findings are in line with the research outlined in the next paragraphs, suggesting that the results of the thematic analysis provide a plausible explanation of early WA development between the trainee chiropractors and their patients.

The interviews illustrated how patients' expectations were shaped by their own previous experiences and recommendations from trusted others. Similarly, in an ethnographic case study exploring the development of trust between a chiropractor and his patients, Bolton illustrated the role of expectations in the chiropractic-patient relationship (Bolton, 2000). According to the author, there are prior conditions that influence how patients define this relationship (Bolton, 2000). On the one hand, the relationship is similar to other everyday encounters because it embraces interpersonal expectations, private agendas, and social conventions. On the other hand, the relationship has a predetermined purpose - improving patients' circumstances. It is further characterised by the mutually recognised discrepancy in the knowledge and power of the parties involved. Bolton (2000) suggested that when a patient first books an appointment, their hope for improvement is not based on the personal or professional characteristics of the chiropractor. Instead, their hope is based on their beliefs about the authenticity of the expertise which the chiropractor is thought to embody. In other words, there are prior expectations of the expertise of a chiropractor which define the chiropractor-patient relationship before the two parties have even met (Bolton, 2000). Likewise, in our study, most patients had already formed positive expectations prior to the chiropractor-patient meeting. After the two parties met, early WA was influenced by 1) trainee chiropractors' ability to display self-confidence and 2) trainee chiropractors' ability to build patients' recognition of their professional expertise.

The impact of others' recommendations and patients' own perception of practitioners' expertise was also evident in a mixed method study in acupuncture clinics (Bishop et al., 2011). First, the authors found that the participants prioritised recommendations when making a decision to consult a particular acupuncturist (Bishop et al., 2011). Second, the findings revealed that potential patients considered qualities such as trustworthiness and expertise to

be important (Bishop et al., 2011). In our study, the chiropractor's self-confidence could impact how a patient perceived their expertise. This is important, because expertise has been previously reported as a quality that patients prioritise. For example, the findings of an integrative review suggested that a *"good"* musculoskeletal physiotherapist should be responsive, ethical, communicative, caring, competent, and collaborative (Kleiner et al., 2023). In the context of this study, the extent to which patients felt confident in the chiropractor's expertise and trustworthiness appeared to shape the process of establishing agreement on the goals of care and the proposed treatment plan. Similarly, the findings from a qualitative study exploring patients' expectations before and experiences after physical therapy for LBP described how participants anticipated the therapist to be the body-oriented expert who can give an accurate diagnosis (Unsgaard-Tøndel & Søderstrøm, 2021).

There were rules of treatment that followed from the education that the trainee chiropractors received in their clinical placement at university. In line with Bordin's conceptualisation of WA, the education underlying chiropractic care sets out certain expectations and demands for the chiropractor and the patient and how they work together to effect change in patients' circumstances (Bordin, 1979, 1994). The extent to which both parties work together following these rules can impact the extent to which change occurs (Bordin, 1979, 1994). The role of WA is to ensure successful negotiation between the trainee chiropractor's expectations, which are guided by their education, and those of the patient, reflecting their own beliefs and understanding of their health (Bordin, 1979, 1994). The three key features of WA, namely, agreement on the goals of care, collaboration on the treatment plan, and the establishment of bonds, facilitate this negotiation.

Our findings suggest that a key factor in early WA development was the role of explanations. To establish chiropractor-patient agreement on the treatment plan, the trainee chiropractors in this study utilised explanations and demonstrations, ensuring that participants felt confident that their treatment was appropriate and designed to deal with a correctly identified problem. The importance of explanations was also illustrated in the results of a mixed method systematic review exploring WA in the chiropractic literature (Ivanova et al., 2022). The findings described how patients tend to view chiropractic care as a change process whose end goal is improvement of their circumstances. It could be argued that the role of the chiropractor is that of a change agent. Satisfactory explanations can ensure that the patients understand the need for a change. In our study, chiropractors' explanations could help patients relate to them, learn

new insights about their body, understand the reasoning behind the proposed treatment plan, and realise the need for potential lifestyle changes.

Furthermore, trainee chiropractors' demonstrations of the required exercise regime built patients' confidence and provided a sense of reassurance that they could correctly follow the treatment plan or the recommended lifestyle changes. The findings of a longitudinal qualitative study examining WA from the perspective of patients receiving physical therapy illustrated how patients experienced the treatment as empowering (Unsgaard-Tøndel & Søderstrøm, 2021). This perception arose from the physiotherapists' effective communication of their expertise through the use of explanations (Unsgaard-Tøndel & Søderstrøm, 2021). Previous research suggested that one possible explanation of the impact of WA on outcomes is the positive correlation between adherence and WA. For example, a longitudinal qualitative study with older adults with knee pain investigated the relationship between WA and adherence (Moore et al., 2020). The study used semi-structured interviews with 30 participants at baseline, who had been randomised to one of three physiotherapist-led exercise intervention arms in a clinical trial (Moore et al., 2020). The findings indicated that strong WA is a key facilitator of exercise adherence in the short and longer term regardless of the intervention arm (Moore et al., 2020). Participants appreciated physiotherapists who took time to get to know them, understand them, empathise with them, and last but not least, explain and show them the exercises (Moore et al., 2020). Similarly, Fuertes and colleagues examined psychological and behavioural sequalae of WA among patients with diverse health conditions including HIV+/AIDS, hypertension, diabetes, asthma, and cancer (Fuertes et al., 2007). They found that stronger patient-rated WA and higher self-efficacy both predicted higher patient adherence to treatment, while stronger WA also predicted greater patient satisfaction (Fuertes et al., 2007).

3.5.2 Study limitations, research opportunities and recommendations

This study explored the formation of WA at the start of chiropractic care from the perspective of 25 patients attending AECCUC undergoing care from trainee chiropractors. To gain a full picture of how WA is established, future research should explore chiropractors' perspectives and the development of WA within cohorts of qualified chiropractors. Additionally, research including participants from different ethnic backgrounds could help explore the role of cultural differences in early WA development. Considering the impact of the clinical setting on patients' expectations, the findings in the theme *"The Context of the Clinic: Setting up the Conditions for the Process of Building Patients' Confidence in the Upcoming Care Journey"* are not directly

transferable to non-training chiropractic settings. Instead, the findings revealed how context can impact the development of WA. While this study was focused on the early stages, future research should advance our understanding of how WA progresses with time. Our findings did not reveal any major disruptions in WA between the trainee chiropractors and the participants. However, a research opportunity that can inform clinical practice is exploring how chiropractors amend disruptions in WA. Furthermore, the study findings demonstrated that established WA was especially important in the context of potentially painful situations, namely during pain assessment and manual intervention. A more in-depth understanding of the relationship between pain, touch, and WA could provide potential recommendations for clinical practice. A potential limitation of our study is that due to practical constraints, interview transcripts and finalised themes were not return to participants to ensure accuracy.

3.5.3 Conclusions

Our findings described early WA development between trainee chiropractors and their patients, which involved a process of building patients' confidence in the trainee chiropractors' expertise, the correctly identified goals of care, and the value of the proposed treatment plan. Factors that shape the process of establishing early WA include the context of the care journey, patients' perception of trainee chiropractors' qualities, and their satisfaction with trainee chiropractors' explanations. Patients further consider their bodily sensations, their expectations, and past experiences.

3.6 Author's Note

Scholars note that past experiences heavily influence the therapeutic relationship, raising concerns that separating the alliance from the transferential may overlook fundamental relational dynamics (Safran & Muran, 2006). This study's primary contribution lies in its comprehensive exploration of patients' perceptions of early alliance development from a critical realist stance. This stance enabled a reflexive thematic analysis that accounts for the impact of patients' expectations, past experiences, trainees' behaviours, and the context in which both parties interact. The findings reveal that early alliance development involves building patients' confidence in 1) the expertise and trustworthiness of the trainees, 2) the identified care goals, and 3) the recommended treatment plan. Subchapter 3.5 presents a comprehensive discussion of the findings in connection with existing literature. Here, I will delve deeper into the significance of patient confidence within a cognitive theoretical framework outlined in subchapter 1.5.6 to aid in a more nuanced interpretation of the study's findings.

Active inference suggests that the brain aims to minimise uncertainty by improving the fit between its internal generative model of the environment and the incoming sensory data (Parr & Friston, 2019). It does this using two strategies. First, the brain optimises its expectations about the variables in the internal model to match incoming sensory data better. Second, the brain can manipulate sensory data by triggering behaviours that lead to sensory input in line with its expectations or by actively changing the environment to fit the internal model's predictions. Krupnik (2023) describes the therapeutic encounter as "*a meeting*" of the patient's and practitioner's generative models, each aiming to minimise uncertainty (Krupnik, 2023). Patient's trust is defined as the perceived confidence that their actions will lead to the expected sensory response from the practitioner. For effective collaboration, the practitioner's and the patient's generative models should minimise uncertainty during the encounter. Developing epistemic trust through a shared generative model can contribute to this goal (Krupnik, 2023).

Epistemic trust involves relying on the information provided by others, whereas epistemic mistrust entails being unable to trust others as a source of knowledge (Li et al., 2023). Fonagy and colleagues (2015) expand on the concept of epistemic trust, defining it as an individual's capacity to acquire and integrate new knowledge in a manner that promotes resilient social

functioning (Fonagy et al., 2015). Humans rely on epistemic trust to acquire knowledge, react to, and adjust to social surroundings. Without this ability, individuals cannot fully capitalise on collaborative processes and integrate as active community members (Li et al., 2023). Epistemic trust allows flexibility arising from openness to social learning and thus constitutes a source of resilience through increasing the individual's capacity to benefit from social relationships, including patient-practitioner interactions (Li et al., 2023). In other words, epistemic trust is crucial for fostering positive alliances (Krupnik, 2023).

Suppose a patient believes that the practitioner's model aims to achieve the same goal, such as addressing the correctly identified root cause of symptoms, as the patient's model. In that case, the patient may be willing to adopt the practitioner's transmitted information and seek to confirm it through active inference. This iterative process can develop mutual epistemic trust, increasing patients' confidence in the upcoming care journey (Krupnik, 2023). Evaluating the trustworthiness of incoming information is a multifaceted task, as it necessitates appraising the reliability of the message, the messenger, and one's own cognitive processes. This task becomes even more complex in real-time interactions. Trust is dynamic and evolves through trial-and-error processes, moving from a state of discovery to predictability, then to dependability, and finally to faith.

When a patient starts their care journey, they typically hold a degree of confidence in the practitioner's expertise, which contributes to establishing mutual understanding and fostering a positive alliance (Krupnik, 2023). However, as they engage with a stranger, their brain might also exercise caution, questioning the practitioner's trustworthiness. People generally operate within epistemic trust but also have the ability for epistemic vigilance (Sperber et al., 2010). Epistemic vigilance refers to the cognitive mechanisms that humans have developed to identify and prevent the spread of false or harmful information. Mentalisation, i.e. the capacity to comprehend and construe both one's own and others' mental states, plays a significant role in establishing epistemic trust. This capacity can be constrained by epistemic vigilance. A patient's generative model may initially choose between epistemic trust and epistemic vigilance mechanisms based on the perceived similarity between theirs and the practitioner's generative models. If defensive communication or doubts surface, it can undermine the patient's epistemic trust, hindering alliance development (Krupnik, 2023).

The patient's sense of self-efficacy can also influence the delicate balance between trust and vigilance throughout care (Krupnik, 2023). Bandura (1999) describes self-efficacy as the belief in

one's ability to accomplish a task successfully (Bandura et al., 1999). A recent perspective suggests its connection to the brain's capacity to anticipate and adapt to challenges, known as allostasis (Krupnik, 2023). Self-efficacy in this context refers to a generative model's confidence in the accuracy of its predictions. It is similar to saying "*I know what I can do*" or, in terms of knowledge, "*I know that I know*". This means that self-efficacy can be seen as a hierarchical system of beliefs, with a general belief in the model's predictive accuracy at the top and more specific beliefs at lower levels. For instance, social self-efficacy ("*I know what people are like*") falls in the middle of the hierarchy: "*I know that I know*" – "*I know what the world is like*" – "*I know what people are like*" – "*I know what my practitioner is like*" – "*I know that what they are saying makes (or does not) sense and is (or is not) true*". In this system, self-efficacy acts as a top-down influencer of trust, both in the model's own predictive accuracy and in the predictive accuracy of others. Depending on whether self-efficacy bolsters trust or vigilance, it can either strengthen or weaken the alliance, thereby carrying significant implications for the treatment process. When the balance between epistemic vigilance and trust is disrupted, it can lead to extremes of either rejecting information outright or overly relying on the other person (Krupnik, 2023).

Fonagy and colleagues (2019) believe that epistemic trust develops first in relation to primary caregivers in early attachment relationships (Fonagy et al., 2019). They suggest that to understand an individual's epistemic stance, we need to consider their early relationships and wider social experiences (Fonagy et al., 2022). Scholars also consider the link between attachment theory and active inference, highlighting their shared emphasis on internal models and predictive processing (Ciaunica et al., 2021; Cittern et al., 2018; Santaguida & Bergamasco, 2023). According to attachment theory, individuals form internal attachment models of themselves and others that guide their behaviour in future interactions (Bowlby, 1988). From the perspective of active inference, these attachment models can be interpreted as predictive internal models of social interactions (Cittern et al., 2018). The models are based on repeated patterns of attachment behaviours and caregiver responses, shaping the child's views of the attachment figure, the self, and relationships in general. The formation of attachment bonds can be seen as a process of active inference, with infants actively seeking information about their caregivers to reduce uncertainty and ensure survival (Cittern et al., 2018). The internal working models guide the perception and interpretation of events, allowing the system to predict future events and prevent inconvenient situations (Santaguida & Bergamasco, 2023). Attachment models are seen not just as individual traits but as reflective of the type of social

interactions and contexts individuals experience (Li et al., 2023). Considering the theorised role of attachment models, the subsequent mixed-methods study explores how patient ratings of WA change and examines the relationship between the ratings and patient attachment. The qualitative component seeks to understand how patients' perceptions of each alliance feature evolve throughout care.

Chapter 4 Progression of Working Alliance in a Chiropractic Teaching Clinic

4.1 Abstract

This longitudinal mixed-methods study explored patients' perspectives on alliance progression in the context of a teaching clinic. A convergent mixed methods approach was employed to understand alliance development, considering patients' perspectives and the underlying causal mechanisms through retroduction. The quantitative component examined how patients' alliance ratings changed over time and their potential association with patients' attachment. The qualitative component studied how patient views on the three alliance dimensions evolved throughout care. The Critical Realism stance shaped the study design.

The multiple regression analyses suggest that higher attachment-related anxiety and avoidance predicted lower ratings of the trainee-patient bond. This insight is crucial because the qualitative results found that the bond was a prerequisite for successful negotiation and collaboration on the treatment goals and tasks. However, the findings further reveal how patients' appraisals of the alliance were shaped by the trainee's agency, suggesting that the negative impact of attachment-related anxiety and avoidance can be potentially minimised. The perceived progress towards their goals also influenced patients' perspectives on alliance progression.

Overall, the study illustrates that alliance progression is a dynamic process occurring in a preexisting context, shaping the actions of the people operating within it. Understanding the role of attachment can contribute to evidence-based practice by informing practitioners about the underlying psychological mechanisms driving patients' thoughts and behaviours on both conscious and subconscious levels.

4.2 Introduction

The patient-practitioner relationship predicts clinical outcomes in a variety of health interventions, including musculoskeletal care (Bishop et al., 2021; Ferreira et al., 2013; Fuentes et al., 2014; Hall et al., 2010). Multidisciplinary research exploring the relationship-outcome association has predominantly utilised Bordin's conceptualisation of WA (Bordin, 1979, 1994). He describes the WA, i.e., the alliance, as a collaborative relationship aspiring to improve patient welfare. Three features characterise the alliance: 1) establishment of emotional bonds (hereafter: bond), 2) mutual agreement on treatment goals (hereafter: goals), and 3) collaboration on defining and implementing tasks involved in the treatment plan (hereafter: tasks) (Bordin, 1979). In line with this conceptualisation, WA is considered a dynamic process shaped by ongoing negotiations between the practitioner and the patient on both conscious and subconscious levels (Safran & Kraus, 2014). Thus, the alliance strength is an emerging factor which consistently evolves within the context of the patient-practitioner relationship (Safran & Kraus, 2014).

While evidence has demonstrated the impact of WA on patient outcomes, it remains unclear how this dynamic process evolves during care (Hall et al., 2010; Lakke & Meerman, 2016). In psychotherapy, scholars have examined whether WA progression adheres to any predictable temporal pattern by measuring patient ratings over time. Researchers have described 1) a stable pattern characterised by consistently strong WA and 2) a linear pattern characterised by steady growth without significant fluctuations (Kramer et al., 2009; Piper et al., 2005). Also, a high-low-high pattern has been reported: it starts with a strong early WA, which decreases in the middle phase of therapy, followed by an increase in its concluding phase (Gelso & Carter, 1994; Muran & Barber, 2010). Both the practitioner and the patient can unknowingly contribute to the dynamic WA (Safran & Kraus, 2014). This emphasises the need to explore the nature of each participant's contribution.

Generally, interpersonal challenges that may arise within WA progression require theoretical and clinical consideration (Safran & Kraus, 2014). Fluctuations in the strength of WA are referred to as ruptures (Safran, 2004; Safran & Muran, 1996). A rupture-repair pattern over time was observed in a study with patients undergoing prolonged exposure treatment (McLaughlin et al., 2014). The findings illustrated that perceived ruptures had led to a decline in the strength of WA

(McLaughlin et al., 2014). Authors suggested that a temporary decline does not necessarily harm treatment outcomes but calls for a successful resolution (McLaughlin et al., 2014). While ruptures in the strength of WA pose challenges to its progression, they also provide opportunities to deepen mutual understanding, agreement and collaboration (Carney, 2020; Muran & Barber, 2010).

Patients' appraisal of WA may be related to their attachment model (Bowlby, 1958). Attachment theory explores how close relationships between people are formed and maintained, as well as how they impact the parties involved (Ainsworth, 1989; Bowlby, 1988). Individual differences in adult attachment are shaped by personal experiences with attachment figures in early relationships. People develop expectations of attachment figures, e.g. parents, from infancy to adolescence. If attachment figures provide a secure base and offer comfort when needed, a child is more likely to grow into an adult who tends to feel comfortable seeking and relying on support from others (Collins & Read, 1990). The responsiveness and availability of attachment figures in times of distress and uncertainty influence individuals' expectations, which are integrated into *"internal working models"* (Bowlby, 1988). These models then shape subsequent expectations, perceptions, and behaviours in later relationships.

People with secure internal working models are more likely to exhibit resilience when faced with a threat to the availability of their attachment figure (Bowlby, 1988). Research suggests that individuals with a secure attachment model tend to have a more optimistic outlook on life and make less catastrophic appraisals of potential threats (Mikulincer & Shaver, 2010). Conversely, those with insecure attachment models are at a greater risk of experiencing emotional and defensive reactions that could adversely impact their relationships and manifest as symptomatic displays of attachment needs (Mikulincer & Shaver, 2019). When attachment security is disrupted, people develop secondary attachment strategies, such as attachment-related anxiety and avoidance (Collins & Read, 1990). Anxiety, which refers to the fear that others will not be available in times of need, as well as avoidance, which involves distrust in others' intentions and compulsive self-reliance, are initially adaptive behaviours (Mikulincer & Shaver, 2019). However, these strategies can become maladaptive when applied to later relationships in which seeking support and comfortable interdependence could be rewarding and beneficial for a person's overall well-being (Mikulincer & Shaver, 2019).

Results from a meta-analysis suggest that individuals with greater attachment security (i.e., low anxiety and low avoidance) tend to form stronger WA with healthcare providers, compared to

those with greater attachment insecurity (Diener et al., 2009; Diener & Monroe, 2011). The authors advocated that practitioners should consider the quality of WA, specifically with individuals who have a history of insecure attachment (Diener et al., 2009; Diener & Monroe, 2011). In general, scholars have suggested that a patient with a secure attachment is more likely to view healthcare providers as a reliable source of support (Hunter & Maunder, 2001). A systematic scoping review from 2019 examined the interplay between patient attachment and WA within cancer care (Kelly et al., 2019). Six of the nine studies examined attachment as an independent or predictor variable. The findings implied that in comparison to insecure attachment, patient secure attachment was predictive of a stronger WA, higher levels of trust, and satisfaction with healthcare providers (Kelly et al., 2019).

A recent two-round Delphi study explored the role of contextual factors in chronic low-back pain rehabilitation from the perspective of qualified musculoskeletal practitioners, including chiropractors (Sherriff et al., 2023). Drawing on their extensive clinical experience, both panels emphasised the importance of patient-practitioner relationships. Nonetheless, practitioners described doubts in relation to their confidence in managing patients' cognitive and emotional needs. Further training was recommended to facilitate the application of psychosocial skills to practice. The authors implied that practitioners would benefit from support with handling patients' negative emotional states, explaining the multi-dimensional nature of pain, using cognitive-behavioural approaches to challenge unhelpful beliefs/behaviours, cultivating self-efficacy, and promoting self-management strategies (Sherriff et al., 2023).

A mixed-methods systematic review applied Bordin's theory to chiropractic care, demonstrating its utility for studying patient-chiropractor relationships (Ivanova et al., 2022). Despite the clinical relevance to the profession, researchers have not investigated the temporal evolution of patient-chiropractor WA. Therefore, this longitudinal mixed-method study aimed to inform evidence-based practice and facilitate further training. We employed both quantitative and qualitative data to explore patient perspectives on WA progression in chiropractic. The primary objective of the quantitative component was to examine how patient WA ratings change over time. The secondary objective was to evaluate the potential association between patient attachment and WA ratings. The qualitative component sought to understand how patient views on each WA feature evolve throughout care, offering a more nuanced examination of their dynamic perspectives.

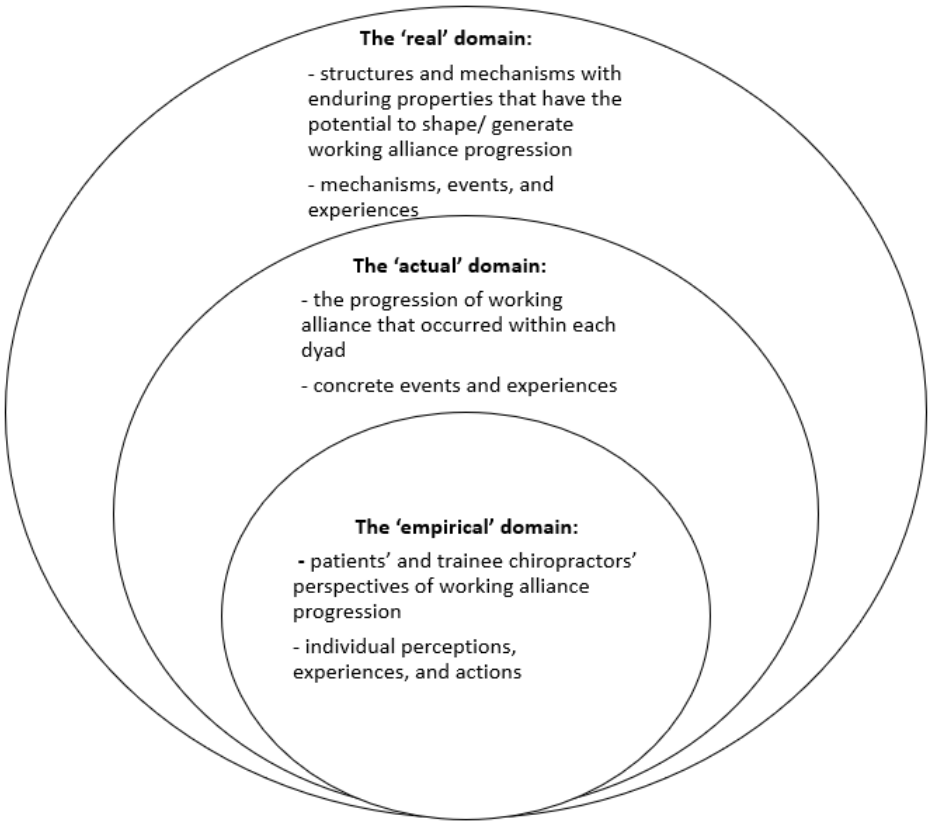
4.3 Methodology

4.3.1 Design

4.3.1.1 Philosophical Framework

We employed a critical realist stance to explore how patients' perspectives of WA progression evolved throughout care (Bhaskar, 1975, 2013). Ontologically, CR assumes a stratified reality based on three nested domains (Bhaskar, 1975, 2013). The most narrowly focused domain is the *"empirical"* domain which embodied patients' perspectives, representing WA progression through the lens of their interpretation. The *"actual"* domain represents the concrete events that did or did not take place throughout care, independently of patients' and trainee chiropractors' perceptions. The *"real"* domain, which encompasses the former two domains, also includes existing structures and causal mechanisms that have the potential to shape WA progression. CR does not imply that the empirical domain is *"less real"* (Fletcher, 2017). Instead, the three domains interact with each other. WA progression is a dynamic process occurring in a preexisting context (de Souza, 2013). This preexisting context can shape the actions of both the patients and trainee chiropractors operating within it (de Souza, 2013). Accordingly, CR assumes that an explanatory theory of WA progression is not absolute: it is relative to various contextual factors (de Souza, 2022). Hence, we aimed to describe trends rather than predictions of the temporal evolution of patient perspectives. Figure 4.1 was adopted from Mukumbang (2023) to illustrate the philosophical framework (Mukumbang, 2023; Mukumbang & van Wyk, 2020).

Figure 4.1 Critical Realist View of Reality



4.1 The image was adopted from Mukumbang (2023) to illustrate how the three domains apply to this study.

4.3.1.2 Convergent Mixed Methods Study

Retroductive theorising is an approach that moves away from the *"empirical"* domain by exploring the context and hypothesising the underlying conditions and causal mechanisms of the phenomenon under investigation (Mukumbang, 2023). The approach aligns with the convergent mixed methods study design, which utilised 1) simultaneous collection of qualitative and quantitative data, 2) independent data analyses for each (qualitative/quantitative) component, and 3) subsequent integration (Creswell et al., 2003; Mukumbang, 2023). We utilised a side-by-side approach to integration: both qualitative and quantitative findings were compared and synthesised within the discussion section (Creswell et al., 2003; Creswell & Creswell, 2022). The integration aimed to 1) explain participants' perspectives of WA progression (abduction); and (2) hypothesise the underlying conditions and the mechanisms that had potentially shaped their perspectives (retroduction) (Mukumbang, 2023).

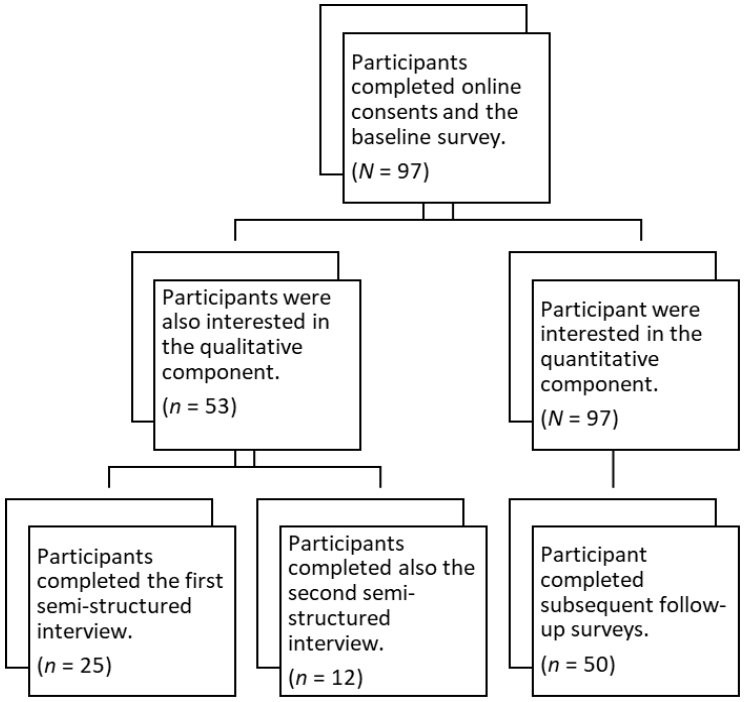
4.3.2 Context

Participants were recruited from the teaching clinic at a university in the south of the UK, where trainee chiropractors in the final years of MSc level degrees work under the close supervision of clinic tutors. While the teaching clinic can simultaneously provide care to many patients, qualified chiropractors predominantly work as lone practitioners or in small practices. Thus, we explored multiple trainee-patient dyads in the same setting, minimising the potential impact of different clinical contexts on alliance progression.

4.3.3 Recruitment

The inclusion criteria for patients were: 1) adults (at least 18 years old) seeking the help of a trainee chiropractor who would 2) be available for the whole duration of treatment and 3) work with them for the first time. Our exclusion criteria were: 1) patients lacking full mental capacity, and 2) inability to complete questionnaires in English. Receptionists sent emails to potentially eligible patients with a link to the study on the online platform Qualtrics (Qualtrics, 2022) and we offered flyers containing the link. If interested, eligible patients could 1) take part only in the quantitative component or 2) in both the quantitative and qualitative components. The following evidence-based strategies were employed to enhance recruitment and retention rates in this study: a small monetary incentive (£10 voucher) for patients upon enrolment (Parkinson et al., 2019) and email reminders (Chaudhari et al., 2020). Figure 4.2 outlines the participant recruitment process for this study.

Figure 4.2 Participant Recruitment



4.2 N is the total number of participants enrolled in the study, and n is the number of participants at follow-up time points.

4.3.4 Participants

4.3.4.1 Quantitative Component

The baseline survey link was accessed on 195 occasions. Eighteen patients did not meet the eligibility criteria due to having attended the clinic in the preceding year. A hundred and forty-seven completed the on-line consent form, but fifty of them did not finalise the baseline survey. The mixed-method study sample included 97 participants - 38 male and 59 female patients from white ethnic backgrounds, with an average age of 46 years (*SD* = 18.9). At baseline, 85 reported experiencing pain, with an average score of 5.3 (*SD* = 2.0) on a 10-point scale. The most often cited reason for seeking chiropractic care at the clinic was low back/ back pain (*n* = 42). Patient levels of familiarity with the discipline were varied, including participants who 1) had no prior experience with chiropractic care (*n* = 39), 2) had received chiropractic care elsewhere (*n* = 37), and 3) had received chiropractic care at the clinic more than a year ago (*n* = 21). Table 4.1 outlines the clinical and sociodemographic characteristics of the sample.

Table 4.1 Participant Baseline Characteristics

Baseline Characteristic	Total Count	*n* (%)
Educational Attainment	*N* = 97	
Incomplete Secondary School (Up to age 16)		2 (2.1%)
Completed Secondary School (Up to age 16)		17 (17.5%)
Completed Sixth Form or College (Ages 16-18)		34 (35.1%)
Undergraduate Degree		29 (29.9%)
Postgraduate Degree (Master's or Doctorate)		15 (15.5%)
Employment Status	*N* = 97	
Employed at Usual Job		50 (51.5%)
Unemployed Because of Other Reasons		3 (3.1%)
On Light Duty or Some Restricted Work Assignment		1 (1%)
Student		15 (15.5%)
Paid Leave/Sick Leave		1 (1%)
Keeping House/Homemaker		2 (2.1%)
Retired		22 (22.7%)
Unemployed Because of Health Problems		3 (3.1%)
Main Reasons for Seeking Chiropractic Care	*N* = 97	
Low Back/Back Pain		42 (43.3%)
Neck Pain		10 (10.3%)
Extremity Problem		3 (3.1%)
Hip Pain		5 (5.2%)
Headache		2 (2.1%)
Shoulder/Arm Pain		16 (16.5%)
Knee Pain		7 (7.2%)
Wellness/Maintenance		4 (4.1%)
Unspecified/Miscellaneous/Other		8 (8.2%)
Duration of Condition	*N* = 93	
Less Than Two Weeks		4 (4.3%)
Two Weeks to a Month		15 (16.1%)
One to Three Months		24 (25.8%)
Three to Six Months		10 (10.8%)
Six Months to a Year		6 (6.5%)
More Than a Year		34 (36.6%)

4.3.4.2 Qualitative Component

A total of 12 patients from the mixed method study sample took part in the qualitative component. They were five female and seven male individuals, with median age of 55 (*M* = 55.42, *SD* = 15.06) a range of 48 years (29 - 77). Participants identified LBP (*n* = 4), neck pain (*n* = 1), shoulder/ arm pain (*n* = 5), wellness/ maintenance (*n* = 1), and other (*n* = 1) as reasons for seeking chiropractic care. Their familiarity with the discipline was varied: four of the twelve participants had never received chiropractic care before, four had received it at different clinics, and four at this clinic more than a year ago. Eleven participants described experiencing pain at baseline with a median score of 6 on a 10-point numerical rating scale (*M* = 5.43, *SD* = 1.10). The majority explained that the onset of their pain was more than one year ago (*n* = 5). The remaining six participants reported an onset of two weeks to a month (*n* = 3), one to three months (*n* = 1), three to six months (*n* = 1), and six months to a year (*n* = 1).

4.3.5 Data Collection

4.3.5.1 Quantitative Component

The quantitative component measured WA on a session-by-session basis. The number of time points varied depending on patient circumstances and reasons for seeking chiropractic care. For research purposes, we utilised the definition of active phase (Fowler, n.d.; Iben et al., 2019). The active phase of chiropractic care starts with a treatment plan tailored to specific goals. Initially, this phase involves frequent visits to address the patient's concerns. When the patient's condition becomes stable, the frequency of visits gradually decreases. The maintenance phase begins once the patient achieves stability, aiming to sustain the acquired improvements and prevent deterioration. We followed up with participants during the active phase of care. Alongside WA, the baseline survey collected clinical and sociodemographic data and measured participants' attachment. After each subsequent appointment with their trainee chiropractor, participants received an email prompting them to complete a follow-up survey. Email reminders were sent if participants had not finished a survey within 48 hours. We sent a total of two emails, one day apart, before marking the data as missing. Table 4.2 provides a summary of primary and secondary measures used in the quantitative component.

4.3.5.1.1 Working Alliance

We explored WA progression via the patient-rated version of WAI-SR (Hatcher & Gillaspy, 2006) which includes four items for each WA feature (Bond, Goals, and Tasks). Table 5.10 illustrates how the questionnaire was displayed in Qualtrics. Built on the Working Alliance Inventory (Horvath & Greenberg, 1986), WAI-SR is considered a concise 12-item measure which embodies Bordin's conceptualisation (Bordin, 1979). WAI-SR has shown evidence of greater differentiation between Goal and Task subscales, alongside acceptable psychometric properties (Falkenström et al., 2015; Hatcher & Gillaspy, 2006). Hatcher and Gillaspy (2006) developed WAI-SR in one sample (Sample 1) and cross-validated it in another (Sample 2) (Hatcher & Gillaspy, 2006). They found that both person and measure reliability was high, with Sample 1 showing a reliability of 0.92 and Sample 2 at 0.88. This suggests consistent results across individuals and the measurement tool. All items fell within acceptable limits for outfit scores, indicating that they effectively measure the alliance at extreme levels (both high and low). It was observed that clients had difficulty discriminating between the lower 5 points of the 7-point scale, as the response steps were too close together, reducing the scale's effectiveness. A 4-point scale with better item response properties was created by merging certain categories. However, in practice, a 5-point scale anchored by a clear low point is more accessible for clients to use consistently(Hatcher & Gillaspy, 2006). Participants in this study were asked to respond to twelve statements on a 5-point scale, generating an overall score with a maximum possible value of 60. Higher ratings indicate stronger WA. Baseline surveys were completed following the initial assessment, shortly after participants had met their trainee chiropractors for the first time. With this in mind, we gave participants the additional option to respond to WAI-SR statements with *"Non-Applicable"*. WAI-SR items were scored on the original 5-point scale for the follow-up surveys.

4.3.5.1.2 Attachment

We explored adult attachment with the use of anxiety and avoidance dimension at baseline via the ECR-RS questionnaire (Fraley et al., 2011). Table 5.11 illustrates how the questionnaire was displayed in Qualtrics. ECR-RS has been used to study general and relationship-specific attachment (Fraley et al., 2015). It is a short nine-item version of the ECR-R questionnaire (Fraley et al., 2000). The ECR-RS has acceptable psychometric properties (Fraley et al., 2011; Rocha et al., 2017). For the purposes of assessing global attachment, we asked participants to rate the extent to which they believe each statement best describes their feelings about close

relationships in general (Fraley, 2014; Fraley et al., 2015). The response options were on a 7-point scale where one indicates strong disagreement and seven indicates strong agreement. The scores on anxiety and avoidance dimensions were calculated separately by averaging the corresponding items, some of which required reverse scoring. High anxiety scores indicate a tendency for strong fear of rejection and a preoccupation with relationships. High avoidance scores indicate an inclination to strong preference for independence and emotional distance. While high scores on both dimensions suggest attachment insecurity, low scores suggest attachment security.

There has been a debate in the literature about the right approach to measuring individual differences in attachment (Fraley, 2014; Fraley et al., 2015). The first option is employing a continuous model that scales individual scores on the two dimensions. The second option is using categorical model which assigns individual scores to four different attachment styles (e.g., secure, avoidant, anxious, disorganised). The former suggests that psychological dynamics can be better understood through two sources of variation rather than four. Findings from taxometric analyses indicated that there are theoretical and pragmatic limitations to the latter (Fraley et al., 2015). The categorical model assumes that a limited number of causal mechanisms shape individual differences. The use of this model when variation is continuous can undermine statistical power and result in false positives (Fraley et al., 2015). The authors demonstrated that individual differences in global adult attachment are continuously distributed (Fraley et al., 2015). Therefore, we utilised the continuous model to understand the effect of attachment, using the average scores of each dimension (Fraley et al., 2015).

Table 4.2 Longitudinal Quantitative Component Measures

Construct	Measure	Items	Timepoint	Completer
Working Alliance	Working Alliance Inventory – Short Revised (WAI-SR)	12	After each appointment	Patient
Attachment	Experiences in Close Relationships–Relationships Structures (ECR-RS)	9	At baseline	Patient

4.3.5.2 Qualitative Component

Patients who had demonstrated interest in the qualitative component were extended invitations to take part in two semi-structured telephone interviews. A female postgraduate researcher (DI) conducted each interview via a direct audio-based call from her Microsoft Teams university account to participants' phones. Interviews utilised open-ended questions to explore and contextualise the dynamic essence of WA progression from patients' perspectives. They started with broad inquiries concerning views associated with the therapeutic relationship, moving to more specific topics such as communication, decision making, collaboration and bonds. Authors included in the topic guide: 1) descriptive questions to gain information on subjective experiences, 2) opinion-based questions to depict personal expectations, beliefs, preferences, and evaluations, and 3) reflective-based questions to understand participants' thought processes. The interview guide is provided in Appendix G. The question topics were informed by the results of a mixed methods systematic review exploring patients' and chiropractors' perspectives on the nature and role of WA (Ivanova et al., 2022). DI conducted a total of 24 semi-structured interviews with 12 patients. The first twelve interviews, with an average duration of 28 minutes, were held early in participant care. The second twelve, with an average duration of 22 minutes, were held at cessation of care. Hereafter, the former will be referred to as first interviews, and the latter - second interviews. Both were transcribed by Voluntary Research Assistants at the University of Southampton; transcripts were checked for accuracy by DI.

4.3.6 Data Analysis

4.3.6.1 Quantitative Component

Participant survey responses from baseline and follow-ups were exported as a merged data sheet. The merged data sheet used a long format, where participants with multiple observations had multiple rows, one for each time point (Steele, 2013). Data analysis was conducted using R Statistical language, version 4.2 (Team, 2023). We visualised the data to examine the general shape, look for trends, and identify outliers or anomalous data points using the package ggplot2, version 3.4.4 (Wickham et al., 2016). We conducted descriptive analysis for the raw data to explore WAI-SR scores at baseline. For the longitudinal analysis, we utilised listwise deletion for 1) baseline responses with missing values for more than one item per feature in WAI-SR and 2) incomplete follow-up responses (Newman, 2014). For baseline responses with one missing item per feature, we replaced the missing item with the mode value of the subscale

it belongs to (Bond, Tasks, Goals). We analysed data from participants with a minimum of three repeated measures using a top-down exploratory approach to LMM via the lme4 package (Bates et al., 2015). The top-down approach involved model pruning of the full model, which was then simplified based on model diagnostics (Zuur et al., 2009). The decision to select a model was based on the AIC, where lower values show superior fit and parsimony. Model pruning aimed to find the model which explained the data most adequately while avoiding overfitting (Yan et al., 2014). We started the analysis with a model which included the fixed effects of time and attachment, their interaction, and random effects of intercept and slope for each participant.

4.3.6.1.1 Missing Data

The total number of completed responses at each timepoint before the handling of missing data is provided at Table 4.3. Out of the 97 baseline WAI-SR responses, 47 had no missing values (48.5%). Mode imputation was completed for 17 baseline WAI-SR responses with one missing item per feature (17.5 %). The remaining 33 baseline WAI-SR responses were treated as missing data (34%). In the follow-ups, there were no WAI-SR items with missing values related to *"non-applicable"* as this option was not available.

Table 4.3 Visit Number and a Number of Complete Responses

Visit Number	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Number of complete responses	97	65	55	37	30	14	8	3	3

4.3.6.2 Qualitative Component

We employed Thematic Trajectory Analysis (TTA) to enable the comprehensive exploration of thematic changes over time (Spencer et al., 2021). This method expands on Template analysis (King & Brooks, 2016) by 1) introducing three levels of templates and 2) visual thematic trajectories. TTA includes investigation of within-person variation and enhances between-person analysis by comparing thematic trajectories and outlining emergent categories based on similarities (Spencer et al., 2021). TTA also offers an engaging illustration of theoretical findings by utilising data visualisation. Spencer and colleagues (2021) proposed a four-step analytical approach which consists of: 1) creation of data display matrices; 2) Thematic Template Analysis

at micro-, meso-, and macro-levels; 3) visualisation of Thematic Trajectories; and 4) Intra- and Inter-Theme Trajectory Analysis (Spencer et al., 2021).

We defined the three dimensions of WA (bond, goals, and tasks) as a priori themes to explore how each had evolved over time to facilitate our understanding of alliance progression. In Step 1, we produced time-ordered display matrices in the form of two tables: 1) one with verbatim data from the first interviews and 2) one with verbatim data from the second interviews. Each table consisted of one row for each participant and one column for each dimension of WA. The cells contained the verbatim data from each participant which we considered relevant to the a priori themes.

We began Step 2 by thoroughly rereading both 1) the tables and 2) the interview transcripts. Next, we employed hierarchical coding within each table, marking and labeling data segments relevant to the research question. We generated lower-level themes with a narrow focus, which were included in the broader a priori themes. Our approach was iterative, allowing for inductive adjustments based on familiarisation with the data. Micro-level analysis involved constructing summaries of the themes for each participant within each table from Step 1. Once finalised, each participant's summary represented their personal micro-template from the corresponding interview. We then combined the micro-templates from both tables into meso-templates, merging them in a joint table. The meso-template of each participant provided a thematic and temporally grounded overview of their data alongside the generated themes, offering a more holistic understanding of how their perspective had changed throughout care.

Next, we summarised and synthesised themes from the analysis at the meso-level, resulting in a comprehensive macro-template of broader thematic patterns in the data. The outputs of Steps 1 and 2 offered detailed representations of thematic data, enabling the emergence of temporal trends. Moving to Step 3, we visualised the trajectories of WA development, spanning from the early to the final stages of care. We used NVivo (Version 12) to create a figure illustrating an overview of individual trajectories. Finally, we conducted in-depth, temporally sensitive analysis both at within-person (how did participant's trajectory change over time) and between-person levels (how does their trajectory compare to others) in Step 4. We then explored how participants' views on the three features changed over time to contextualise the identified trajectories.

4.4 Results

4.4.1 Quantitative Component

4.4.1.1 Baseline WAI-SR

Descriptive statistics for WAI-SR are presented in Table 4.4. The maximum possible score for each item was five. To visualise missing data, we included the mean score of each item alongside the number of participants which have selected the supplementary *"Non-Applicable"* choice in the baseline survey. The mean score for the goal subscale was $M = 4.8$ ($SD = 0.6$), the task subscale was $M = 4.6$ ($SD = 0.6$), and the bond subscale was $M = 4.7$ ($SD = 0.6$). Cronbach's alpha coefficients for goal ($\alpha = 0.90$), task ($\alpha = 0.87$), and bond ($\alpha = 0.91$) subscales indicated good internal consistency, suggesting the items within each subscale were reliably measuring their respective alliance dimensions.

Table 4.4 Baseline Working Alliance Ratings

WAI-SR Item	N	M	NA
I believe my chiropractor likes me.	77	4.49	20
What I am doing in chiropractic care gives me new ways of looking at my problem.	76	4.51	21
I feel my chiropractor cares about me even when I do things that he/she does not approve of.	60	4.60	37
I feel that the things I do in chiropractic care will help me to accomplish the changes that I want.	92	4.63	5
My chiropractor and I collaborate on setting goals for my care.	77	4.65	20
As a result of this session, I am clearer as to how I might be able to change.	74	4.66	23
My chiropractor and I have established a good understanding of the kind of changes that would be good for me.	76	4.68	21
I feel that my chiropractor appreciates me.	83	4.70	14
I believe the way we are working with my problem is correct.	82	4.78	15
My chiropractor and I agree on what is important for me to work on.	78	4.79	19
My chiropractor and I are working towards mutually agreed upon goals.	84	4.85	13
My chiropractor and I respect each other.	94	4.86	3

Table Description: 1) *N* - number of participants, 2) *M* = mean score of each item, and 3) *NA* - where participants indicated the item was not applicable.

4.4.1.2 Primary Objective

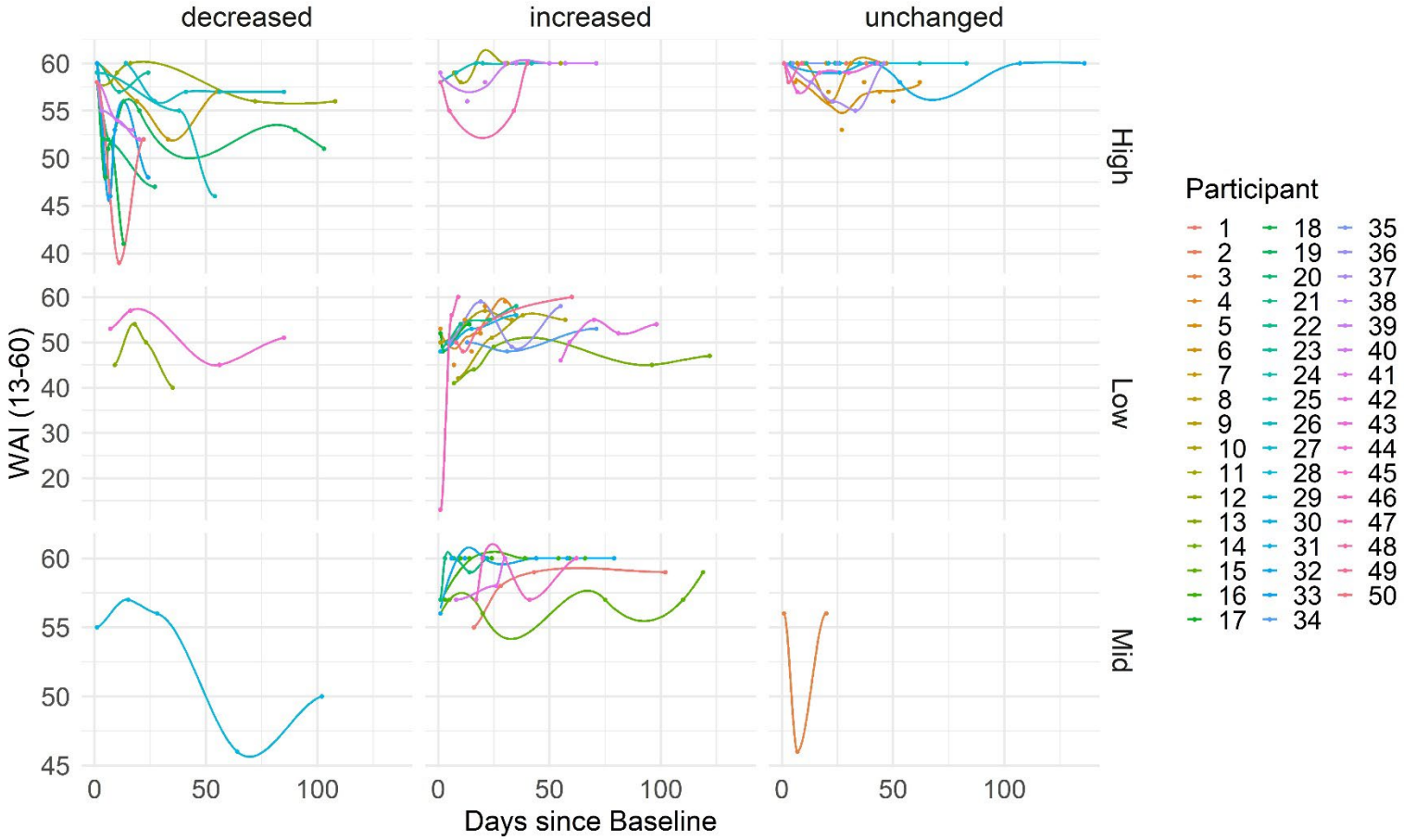
4.4.1.2.1 Descriptive Statistics

A total of 50 participants (all who had a minimum of three repeated WAI-SR measures) were included in the longitudinal exploratory analysis. Thirty-three of them had no missing baseline WAI-SR responses (66%). For the remaining seventeen participants (34%), we used their next WAI-SR response as a baseline. The distribution of baseline WAI-SR had a median of 58 (13-60). The interquartile range around the median was seven (Q1 = 53, Q3 = 60). We grouped participant baseline scores into three categories (low, mid, and high) based on the first, median, and third quartiles. This was due to the third and fourth-quartile values being equal, We also identified changes over time by comparing the baseline and last response of each participant, resulting in three categories – increased, decreased and unchanged WAI-SR. Table 4.5 provides a summary of descriptive statistics for each Baseline and Change category. Figure 4.3 illustrates individual WA trajectories across groups.

Table 4.5 Descriptive Statistics across Groups

Baseline Score	Change in WAI-SR	n	M	SD	Min	Max
Low (WAI-SR score ≤53)	decreased	2	49.38	5.63	40	57
Low (WAI-SR score ≤53)	increased	12	51.16	7.22	13	60
Mid (WAI-SR score from 54 to 57)	decreased	1	52.80	4.66	46	57
Mid (WAI-SR score from 54 to 57)	unchanged	1	52.67	5.77	46	56
Mid (WAI-SR score from 54 to 57)	increased	7	58.68	1.60	55	60
High (WAI-SR score ≥58)	decreased	12	54.57	5.02	39	60
High (WAI-SR score ≥58)	unchanged	11	59.06	1.60	53	60
High (WAI-SR score ≥58)	increased	4	58.96	1.60	55	60

Figure 4.3 Alliance Trajectories over Time



Note: 1) WA change groups: decreased, increased, unchanged over time; 2) Baseline score groups: low, mid, and high; 3) Participants' trajectories (1-50) are presented in different colours;

4.4.1.2.2 Linear Mixed Model

We examined the relationship between WA (measured by WAI-SR scores) and two predictor variables, attachment (measured by ECR-RS) and time (measured by number of days since baseline survey completion). The model selected for analysis was LMM (formula: WA ~ Attachment + Time + Attachment:Time) with a random intercept (formula: ~1 | Participant). The model (estimated using Restricted Maximum Likelihood with the nloptwrap optimiser) demonstrated the lowest AIC value among the candidate models (AIC = 1404.34). Standardised parameters were obtained by fitting the model on a standardised version of the dataset. CI and p-values were computed using a Wald t-distribution approximation. The overall explanatory power of the model was substantial (conditional R^2 = 0.41), and the part related to the fixed effects alone (marginal R^2) is of 0.06. The effect of attachment was statistically significant and negative, β = -1.84, CI [-3.15, -0.52], $t(221) = -2.75$, p = 0.006, Standardised β = - 0.21, 95% CI [-0.41, -0.00]. For every one-unit increase in attachment insecurity, the alliance decreases by 1.84 units on average. The effect of time was statistically non-significant and negative, β = -0.06, 95% CI [-0.13, 0.01], $t(221) = -1.76$, p = 0.08, Standardised β = 0.06, 95% CI [-0.06, 0.19]. This suggests that time, i.e. the number of days since baseline, was not associated with patients' alliance ratings. The interaction effect of attachment by time was statistically non-significant and positive, indicating that the effect of attachment is potentially slightly stronger as time increases, β = 0.02, 95% CI [-0.00, 0.05], $t(221) = 1.95$, p = 0.052; Standardised β = 0.11, 95% CI [-0.00, 0.22]. However, the effect is not strong enough to draw conclusions.

4.4.1.3 Secondary Objective

In order to explore further the relationship between attachment dimensions and WA, we fitted three multiple linear regression models – one for each dimension. Bootstrap resampling with 1000 samples was employed to estimate the coefficients and assess their significance. The results, based on bootstrap coefficients, are presented in Table 4.6. Anxiety (p = .004) and avoidance (p = .008) were statistically significant negative predictors of participants' appraisal of the bond. An increase in attachment-related anxiety was related to a decrease in the bond, with a moderate strength of relationship (β = -0.234). Likewise, an increase in avoidance was also associated with a decrease in the bond, with the relationship being stronger (β = -0.334) compared to attachment-related anxiety. Avoidance was also a statistically significant negative

predictor of participants' appraisal of task-related alliance (β = -.300; p = .039). Neither avoidance nor attachment-related anxiety was associated with participants' appraisal of the goal-related alliance.

Table 4.6 Bootstrap for Coefficients

Alliance Dimension	Attachment	β	Bias	SD	*p*	Lower CI	Upper CI
Bond	Anxiety	-.234	.000	.084	.004**	-.411	-.077
Bond	Avoidance	-.334	.003	.126	.008**	-.580	-.095
Goal	Anxiety	-.099	.002	.093	.276	-.276	.079
Goal	Avoidance	-.230	-.007	.130	.085	-.513	.020
Task	Anxiety	.041	-.002	.095	.675	.167	.215
Task	Avoidance	-.300	-.010	.143	.039*	-.613	-.039

Table Description: * $p < .05$. ** $p < .01$.

4.4.2 Qualitative Component

4.4.2.1 Overview

Findings from the first interviews offer a valuable insight into patient expectations and initial impressions within the formation of early WA. This insight serves as a foundation for understanding the gradual development of their perspectives on the three WA features - the establishment of 1) bond, 2) goals and 3) tasks. The findings from the second interviews illustrate the changes in patient views on the three WA features. We observed interconnectedness between the features of WA. The patient-trainee bond was a prerequisite for successful negotiation and collaboration on the treatment goals and tasks.

4.4.2.2 How did patients' perception of the bond change over time

Trainee chiropractor-patient bonds included participant perception of 1) their confidence in the trainee chiropractor and the upcoming care journey, 2) the extent to which they feel at ease, and 3) the established trust. These three aspects were crucial throughout both the early and final stages of care.

4.4.2.2.1 Confidence in the trainee chiropractor and the upcoming care journey

In the first interviews, the degree of patients' confidence was shaped by preceding expectations rooted in their past experiences, the reputation of the clinic, recommendations from trusted others, and a general faith in healthcare providers. After the clinical encounter, trainee chiropractors' explanations, perceived self-confidence and expertise, and willingness to consult with a tutor were identified as influencing factors. Some patients also considered the trainee chiropractors' assertive approach and the thoroughness of the first assessment. With time, if confidence in the trainee chiropractor had been established, it often evolved into feelings of respect and admiration for their expertise. For instance, in the second interview, Participant 5 praised the trainee chiropractor for their competence and described a newly found respect for the chiropractic discipline. At the end of care, patients also considered the progress towards established goals in their appraisal of the trainee-patient bond, yet their reflections revealed individual differences. While most patients described feelings of strong confidence in the second interviews, Participant 11 felt dissatisfied with their slow progress and was doubtful of their trainee chiropractor's ability to identify the precise cause of their symptoms. Consequently, they intended to seek assistance from another professional, contemplating whether a more experienced practitioner might succeed in identifying the root cause: *"I kind of wonder if I went to a fully qualified chiropractor… whether I would have had a better understanding of what the issue is, rather than somebody who is still in development and training"* (Participant 11). In contrast, despite a failure to achieve their initial goal, Participant 6 expressed confidence in their trainee chiropractor's expertise. The trainee chiropractor had addressed participant's doubts by providing comprehensive explanations, thus increasing confidence in the changed treatment plan designed to achieve a revised mutually agreed-upon goal.

4.4.2.2.2 Feeling at ease with the trainee chiropractor

In the first interviews, patients expected to feel at ease with their trainee chiropractor, noting gentleness, active listening, good bedside manner, and friendly but professional attitude as facilitators. The personal rapport developed gradually, leading to more open communication. Facilitators which were emphasised in the second interviews were trainee chiropractor person-centred approach and ability to recollect and consider individual circumstances. While most patients highlighted the value of light casual conversations on non-treatment-related topics in the context of building rapport, some appreciated less socially engaging interactions with their

trainee chiropractor. For instance, Participant 10 defined their bond as *"being a professional, not very friendly relationship"*. Participant 10's appraisal of the rapport was very affirmative, acknowledging the gentle and caring attitude of the trainee chiropractor who had respected their personal boundaries. The positive evaluation was aided by the lack of forced social engagement: *"If it was somebody I felt I had to socialise with, I would find it more difficult, and I personally would be struggling to find things to talk about"*. This example illustrates the impact of a person-centred approach on rapport formation, demonstrating the importance of individual preferences. Patients reflected on the growing familiarity with their trainee chiropractor. In retrospect, they described a developed sense of comfort, which had fostered an atmosphere where both parties could share humour. The rapport also facilitated negotiation and improved communication. Participant 6 shared their view: *"I seem to have established a rapport…and that helps, you then talk to the person on a more normal sort of level. And I think you then probably would open up and say "well actually I didn't do this" [referring to task adherence]"*.

4.4.2.2.3 Trust

In both interviews, patients viewed trust as an essential aspect of the bond, consistently bringing up its role in the context of manual interventions. There were individual differences in their approach to trust formation in the first interviews. Reflecting on their first impressions, some patients explained that trust is a feeling they get when they meet someone. Initially, trust was often built on patients' confidence in trainee chiropractors' expertise and ability to put them at ease. Other patients conveyed a predisposition to trust people, choosing to trust their trainee chiropractor until there is a reason not to. For instance, Participant 8 reflected on their trust, which had remained steady throughout the care journey:

> *I did go to different chiropractors for a long time, so I sort of trust them anyway. I think I go in with trust that's to be lost, if you know what I mean, rather than to be gained, because if you go in and you don't trust them, you're going to be too tense and the adjustments aren't going to affect you, so I guess my trust hasn't changed.*
>
> **Participant 8**

In contrast, some patients articulated that they see trust as something to be earned. Keeping in mind their prior negative experience with a different chiropractor, Participant 10 shared in the first interview that they expected the trust to grow over time. Fortunately, they reported

complete trust in the second interview. In the final stages, patients' trust was further shaped by their appraisal of progress resulting from their treatment.

4.4.2.3 How did patients' perception of the mutual agreement on care goals change over time

Patient perception of establishing mutually agreed upon goals was shaped by three key aspects throughout care: 1) their expectations, 2) their perceptions of trainee chiropractors' expertise, and 3) the trainee chiropractors' explanations. According to patients, trainee chiropractors demonstrated their expertise by consistently providing clear and satisfactory explanations. In the beginning, patient confidence in the goals was based on individual appraisals of trainee chiropractors' expertise. Some patients also acknowledged their general faith in healthcare providers, expressing that they intended to trust the experts to lead the process. Tutors' supervision and the thorough first assessment were additional facilitators. Patients held varied expectations regarding the prospective success of their treatment outcomes. They appreciated when they felt listened to, understood, and validated in their concerns, and they felt confident that their needs would be considered consistently. They expected that their questions will continue to be addressed throughout care.

Patients who had a specific goal in mind, wanted to feel validated by their trainee chiropractor and be confident in the proposed treatment plan. Participant 6, who described themselves as physically active, reflected:

> *If you're injured, of course, what you want to do is just get over it. So, you're expecting that the chiropractor is going to provide a proper treatment for you…I have no injuries so far, but my goal is how can we do to prevent any injuries…That's why I said, "I'm okay now, but let's see how can we do in order for me to prevent any injuries"*.
>
> **Participant 6**

From the start of care, Participant 6 felt assured in the established agreement on goals: "She [the trainee chiropractor] knows very clear what I want…the first time she made a plan was depending on my goals, so she knows, she's very goal orientated…she said the plan is for me not to get injured, so yeah, she's taking into account my goals". Over time, Participant 6 developed strong WA with their trainee chiropractor, which remained positive despite failure to achieve their initial goal: "I was unlucky, it didn't work because I got injured…So yeah, it wasn't

very successful, but I don't blame the chiropractor at all because I'm still going to the same chiropractor."

If patients had sought help to alleviate pain, they expected trainee chiropractors to identify the root cause. At the end of care, Participant 12 shared their reflections:

> *It went very well, and my shoulder, which was the initial problem, is very much better. But I'm sure that's because it was diagnosed correctly and I was given the right exercises and I did the right exercises, and even after a couple of weeks, there was a marked improvement in it. And now I don't seem to have any problem at all.*
>
> **Participant 12**

In contrast, Participant 11, still lacking a comprehensive explanation for their symptoms, justified their decision to discontinue care: *"I just need to understand what's going on with my body rather than guessing I suppose, which is what it feels like and we're at"*. Generally, the general faith in trainee chiropractors as *"the experts"* and the expectation that the experts will address the root cause of symptoms continuously shaped the agreement on goals. In the final stage, Participant 1 reflected retrospectively on their journey: *"My life in his hands…there's certain occupation, certain jobs. Well, if you get on a plane, you assume the captain's going to do his job, then you hope he's going to do it anyway. So, there we go. That was my analogy. I'm really pleased because, you know, he's pleased with the progress I've made as well"*.

Findings from the second interviews reveal how trainee chiropractors' explanations had enabled patients' realistic expectations of the treatment process and its outcomes. If agreement on a realistic timescale had been established early on, patients were satisfied even when the progress was slower than they had initially hoped for. Participant 8 shared their perspective: *'I think lots of people walk in and go "I want this fixed now…" and they go. Unless you have the understanding that some things aren't fixable or some things take time, you're not going to achieve it so. I think me and the chiropractor stated from the start our ambitions and they were aligned so that helped'*. Most patients noted early on that successful negotiation on the goals of care required effective communication, acknowledging their own role in the process. Participant 11, who planned to consult another professional for a more precise understanding of the cause of their symptoms, elaborated:

> *It's probably on me. As I say, not necessarily being able to explain I what I feel in a in an effective manner…I don't know whether there's a different way that the chiropractor*

can sort of help extrapolate that information a little better from me and try to understand what they need to know and the kind of sensations and feelings that I need to look out for and feel.

(Participant 11)

In the second interviews, patient viewpoints on agreed-upon goals involved reflections on care cessation. Some looked forward to being less reliant on their trainee chiropractor: *'I think I'm 85 per cent through to getting there, and the student has also said, "well, hopefully very soon he won't ever see me again.", but in a joking way, a light-hearted way which is of course exactly what I think. I don't want to be going back there you know another year'* (Participant 4). Others, who described themselves as physically active individuals, intended to continue working with the trainee chiropractors for wellness and maintenance. Treatment was perceived as a self-care practice: *"I look forward to going to see my chiropractor as one would look forward to going for a massage. You know, it's part of my health and well-being…You've got to look after yourself and this is part of it…And now I see that, it's part of what I do"* (Participant 7). Some considered the chronic nature of their pain: *"To be honest with chronic pain is never a finished story. But obviously I can't forever go to the chiropractor. I did for years and years and years and then I stop again for years and years…and then it looks like I'm starting again"* (Participant 2).

4.4.2.4 How did patients' perception of the mutual agreement and collaboration on treatment tasks change over time

In the first interviews, patients hoped to continue engaging in an ongoing negotiation with their trainee chiropractor rather than receiving a one-sided lecture. In the second interviews, they noted the contribution of trainees' explanations and demonstrations, which had empowered them to be actively engaged. Patients' engagement was shaped by 1) their appraisals of the bond, 2) their understanding of the task-goal link, 3) their views on their role in care, and 4) trainees' positive feedback.

4.4.2.4.1 Patients' appraisal of the bond

The bond, which involved 1) patients' confidence in the trainee chiropractor, 2) the extent to which they feel at ease, and 3) the established trust, had an impact on collaboration throughout care. Generally, trainees' demonstration of expertise through satisfactory explanations increased patients' confidence in the value of proposed tasks. Understanding of the link

between goals and tasks was essential for adherence. Some patients also shared how the trainees' confident approach helped them feel reassured. Participant 5 elaborated on their experience of manual interventions:

> *If someone is handling you a bit nervously, that's going to make you tense up a little bit more and you're probably not going to get much out of the treatment. If they handle you confidently and they clearly demonstrate that they know what they're doing, it definitely helps you to relax. And she [the trainee chiropractor] did actually say to me that I did start to relax a lot more sort of week four and onwards.*
>
> **Participant 5**

Perceiving the trainee chiropractor as *"the expert"*, some patients were open to following recommendations by default. Participant 12 reflected on their role: *"Basically to do what I'm told to do…because he [the trainee chiropractor] obviously knows better than I do how what I do is going to improve how I feel"*. Yet, Participant 12 also needed explanations for their peace of mind: *"I like him to explain what he's doing and why he's doing it and I ask questions along the way which if I get the answers, make me feel confident that I'm in safe hands"*. Receiving thorough explanations was also essential in patient's appraisals of their comfort levels. Patients' comfort levels and evaluation of the rapport were particularly in the context of manual interventions. Some patients acknowledged how trainees had offered consistent reassurance, effectively alleviating their concerns. Participant 2's experience offers an example:

> *You know she's not one of those chiropractors who say "let me do my job. I know exactly what I'm doing" …She will ask me the question "Is it where it is hurting?" And then she gives me some anatomy lessons as well because I will say to her "So what is that matter? What does that muscle do" and she always answers my question. Her knowledge is quite impressive really. She knows so much about the body and then that's another aspect on the physical side on manipulation.*
>
> **Participant 2**

The established bond can enable knowledge transfer, enhancing patients' understanding of the treatment tasks.

4.4.2.4.2 The goal-tasks link and patients' perception of their role in care

Initially, patients expected that *"the experts"* should offer guidance while seeking feedback to identify potential challenges or areas of discomfort. Patients' role at the start of care was described as providing honest feedback on how the tasks affect their symptoms. Participant 4 shared: *"There's no point hiding things and if something isn't working…I believe I would be polite and friendly in saying if something wasn't working"*. Some patients emphasised the importance of tangible progress:

> *I've got to do my part as well with the exercises I've been given… But I expect that he would do the treatment that, at the end of the day, I'm paying for…you would expect to have the problem certainly improved if not go away properly.*
>
> **(Participant 9)**

Trainees were expected to observe patients' exercise performance and offer feedback to ensure precise adherence. Participant 8 preferred a written copy of the treatment plan instead of a verbal explanation, noting that the former would highlight the required tasks between sessions, simplify adherence monitoring, and provide a tangible sense of progress. In the second interviews, patients viewed their care journey as a process of collaborative efforts. They expressed gratitude for receiving advice and devising a plan on day-to-day symptom management, elaborating on their own efforts throughout the care journey. According to Participant 7: *"You can't go to a chiropractor once a week…and then do nothing yourself. You know, it's just not going to work…chiropractic care isn't about that, you know. It's about working together"*. Consistent task engagement was viewed as essential. Patients recognised that the transferred knowledge had increased their understanding of how their actions align with their goals. Participant 10 shared what they have learnt: *"I suppose just how much I need to remember to look after myself and do my exercises, sit properly… And that I need to make sure that even when the treatment is finished, I'm probably going to have to continue"*.

4.4.2.4.3 The impact of positive feedback

Trainees' positive feedback on patients' efforts was seen as valuable, including affirmations of patients' progress and acknowledgment of their efforts. Participant 2 reflected:

> *I said I don't know if I can still do the exercise because I'm in pain, but I was telling myself that. And then she [the trainee chiropractor] said "well, let's just go to the*

exercise room and see, we will take it slowly." And then all of a sudden, I just felt energised. It was like "Oh, I can do this". And I felt so much better afterwards. But it's all to do with how I am and how I speak to my brain.

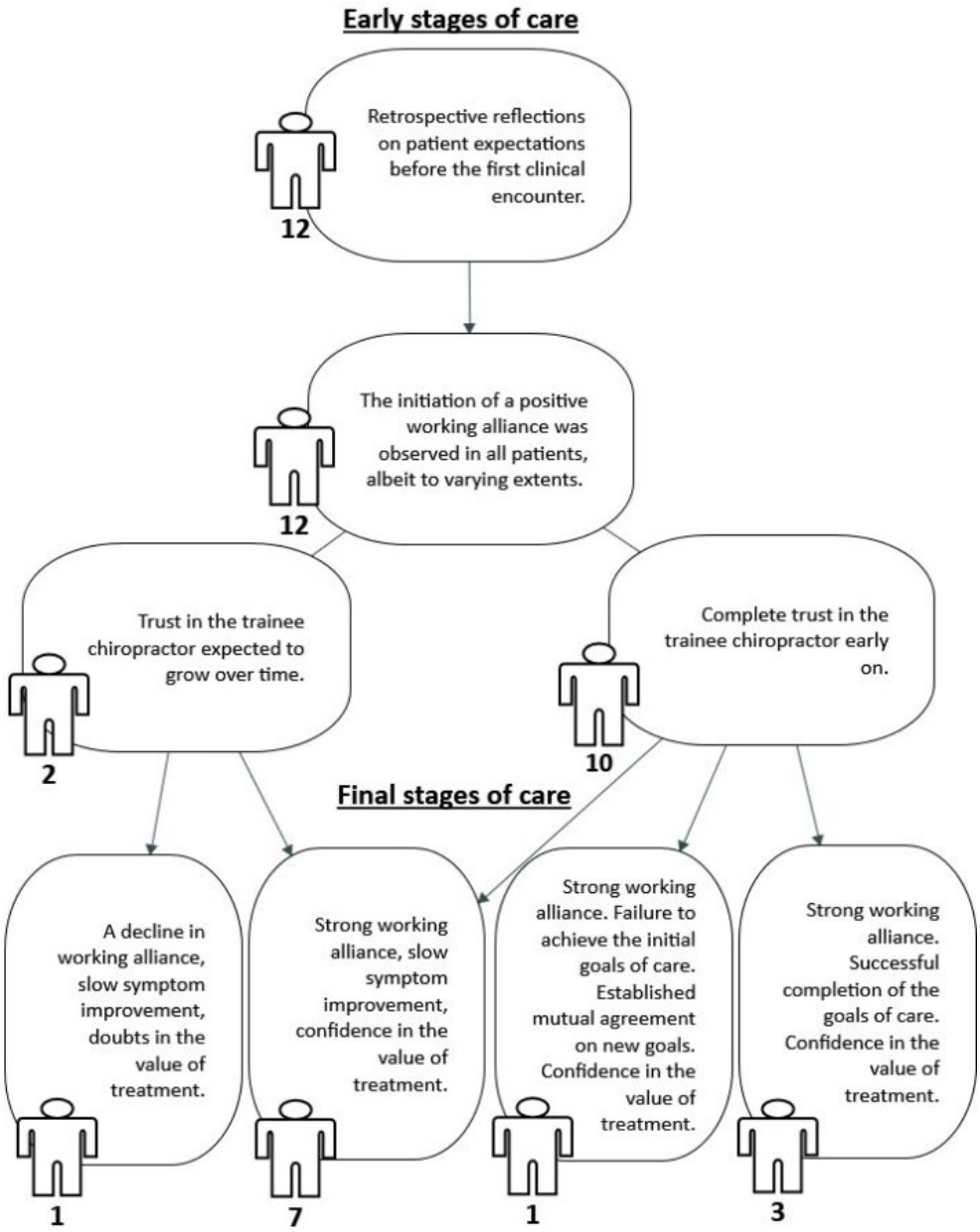
(Participant 2)

Appreciating trainees' reassurance, some patients described finding joy in the clinical encounter because their self-confidence was lifted. Acknowledgments of their efforts facilitated task collaboration. In the second interview, Participant 1 reflected on their decision: *"I can afford to do what other people might decide it doesn't necessarily need doing [continue chiropractic care], but I get pleasure from going and getting my confidence boosted and being told that I'm moving in the right direction."*

4.4.2.5 Trajectories of working alliance development from a patient perspective

We found five distinct trajectories illustrating the temporal evolution of the perspectives of the twelve patients (outlined in Figure 4.4). From the CR perspective, these five trajectories depict alliance progression as reported by the participants in the qualitative segment rather than universally generalisable predictions of patient-chiropractor alliances.

Figure 4.4 The Five Trajectories of Alliance Development



4.3 The digits next to each box represent the total number of participants to whom the statement in that box is applicable.

4.4.2.5.1 Trajectory 1

Participant 11 initially shared: *"I wouldn't say that I can trust them [the trainee chiropractor] completely, because I've only met them once"*. In the second interview, they expressed doubts based on the perceived lack of clear cause of symptoms and the slow progress. They noted:

I would have sort of hoped that we might have been able to fully understand what was going on and while that might take time to resolve it, we'd actually have a clear picture as to what the issue was. But I suppose my frustration is that I don't feel like we've quite got there yet.

Participant 11

4.4.2.5.2 Trajectory 2

Participant 10 also viewed trust as something to be gained over time, and in the second interview, they described positive WA and established trust. They reported slow progress towards their goals but felt confident in the value of treatment.

4.4.2.5.3 Trajectory 3

Six of the ten participants who trusted their trainee chiropractor early on described slow progress towards their goals. Nevertheless, their perspective on WA was positive, including trust in the trainees and confidence in the value of treatment.

4.4.2.5.4 Trajectory 4

Participant 6 trusted their trainee chiropractor from the start. Their trust remained strong despite a failure to achieve the patient's initial goals. Their view on the WA was positive, including confidence in the newly proposed goals and tasks.

4.4.2.5.5 Trajectory 5

Three of the ten patients who had formed trust early on described strong WA and successful completion of their goals.

4.5 Discussion

4.5.1 Summary of Key Findings

4.5.1.1 Quantitative Component

Regarding the primary objective, the effect of time and the effect of the interaction of attachment by time on WA ratings did not reach statistical significance. However, the *p*-value of the interaction was close to 0.05, implying a potential trend that should be explored further with

larger sample sizes. Regarding the secondary objective, there was a statistically significant and negative effect of attachment insecurity on alliance ratings. Upon further investigation, the results of a multiple regression found that higher attachment-related anxiety predicted lower ratings of the trainee-patient bond. This effect was moderately strong with a value of β = -0.234. Similarly, higher attachment-related avoidance predicted lower ratings of the bond, but with a stronger effect (β = -0.334) than that of anxiety. The other WA dimensions' relationships with attachment were less clear, with only attachment-related avoidance presenting as a statistically significant negative predictor of tasks.

4.5.1.2 Qualitative Component

Patients elaborated on the essential factors which had formed their first appraisals of WA and were also expected to continue playing a role in its later development. They described varying degrees of familiarity with both the clinical setting and the discipline itself. Patients' perspectives on the bond considered their confidence in the trainee chiropractors and the upcoming care journey, the extent to which they felt at ease, and the established trust. Perspectives on the goals were shaped by patients' expectations, alongside their appraisal of trainees' expertise, and the received explanations. Perspectives on tasks agreement and collaboration were shaped by evaluations of the bond, understanding of the task-goal connection, views on their role in care, and trainees' positive feedback.

The initiation of WA was evident early on, despite individual differences in the extents to which bonds and mutual agreements had been established. Most varied were patients' views on trust formation. Two patients described trust as *"something to be gained"*, expecting that their trust would grow over time. Ten patients reported complete trust early on, expecting it would persist unless there was a compelling reason for it to change. Some patients explained that their trust was the feeling they got from the first clinical encounter. Others perceived trust in general as *"something to be lost"*. In the second interviews, perspectives on WA were shaped by the interplay of patients' evaluations of the factors they had identified as essential and the perceived progress towards their goals. The interconnectedness between the dimensions was illustrated, emphasising the role of the bond in the process of establishing mutual agreement and collaboration on both treatment goals and tasks.

4.5.2 Integration: Implications for Research, Theory, and Practice

Both the quantitative and qualitative analyses found no single distinct temporal pattern characterising alliance progression, with some patient ratings increasing, others decreasing or remaining stable over time. There is a lack of research on the temporal evolution of patient-practitioner alliances in musculoskeletal care. Existing studies prioritise identifying the factors impacting alliance strength, overlooking the relational events that cause actions, reactions, emotions, and thoughts, thus shaping both parties' dynamic perceptions of the relationship (Babatunde et al., 2017; Horton et al., 2021).

Our findings illustrated that the patients viewed a positive bond with their trainees as a prerequisite for collaboration on the treatment goals and tasks. Future research should explore chiropractors' perspectives on alliance development. For instance, a qualitative study found that physiotherapists perceived the alliance as a mechanism for getting patients on board with the management strategy or treatments suggested by them, revealing a more therapist-centred view of care (Cosgrove & Hebron, 2021). We argue that the successful delivery of care depends heavily on the establishment of a genuine mutual bond. Chiropractors should apply epistemic humility to clinical practice, acknowledge the complexity of human behaviour, challenge their own preconceived assumptions, and approach individuals' unique circumstances with curiosity and compassion in a patient-centred manner (Costa, Olson, et al., 2023).

Our quantitative results found that higher patient attachment-related anxiety and avoidance predict lower ratings of the bond, with the relationship between avoidance and bond being stronger than that between anxiety and bond. Future research should investigate the role of patients' attachment in alliance development to inform clinical practice by identifying the psychological mechanisms driving patients' thoughts and behaviours on both conscious and subconscious levels. Scholars suggest that practitioners can serve functions typically associated with attachment figures (Maunder & Hunter, 2016). In this study, the trainee chiropractors were perceived as *"the experts"* and were expected to lead the process of negotiation, identify the root cause of symptoms, provide guidance, and offer reassurance, validation, and praise throughout care. Certain trainee-patient interactions may have intended to fulfil patients' attachment-related needs, namely, obtaining and maintaining the perception of safety required to manage situations involving distress and uncertainty (Maunder & Hunter, 2016). For instance, some trainee chiropractors effectively alleviated patients' concerns about manual interventions by offering continuous reassurance.

People with secure attachment tend to have confidence in their ability to handle distress and uncertainty using constructive emotion-regulation strategies, such as seeking support (Mikulincer & Shaver, 2019). In contrast, people with high attachment-related avoidance rely on cognitive distancing and emotional disengagement, while those with high attachment-related anxiety tend to engage in anxious or gloomy thoughts about distressing and uncertain events (Mikulincer & Shaver, 2010; Mikulincer & Shaver, 2019). However, a positive alliance can help patients manage such challenges in a more constructive manner by creating a safe and trusting environment (Connolly, 2022). While the quantitative results found that patients' attachment insecurity predicted their ratings of the bond, the qualitative findings illustrate that patients' perspectives were continuously shaped by the agency of their trainee chiropractors.

Exploring the uncertainty surrounding LBP, researchers suggest that many of the challenges patients experience concern the interactions with their practitioners, e.g. feeling unheard, not taken seriously, and confused about the communication regarding diagnosis and prognosis (Costa, Butler, et al., 2023). In our study, a patient planned on seeking help elsewhere because they felt uncertain about the trainee's expertise and ability to provide an accurate diagnosis. This is where the quality of the patient-trainee alliances played a crucial role. The bond, including patients' appraisal of trainees' expertise and trustworthiness, facilitated negotiation and enabled the transfer of knowledge. If a realistic timeline had been agreed upon, patients were still confident in the utility of care even if their progress was slower than initially hoped for. Trainees' comprehensive explanations played a crucial role in setting realistic expectations for patients regarding the potential outcomes of treatment and thus minimising patients' perception of uncertainty.

Evidence from systematic literature reviews suggests that a positive alliance can improve patients' engagement in treatment and increase their adherence to recommended tasks (Allen et al., 2017; Bourke et al., 2021). In our findings, patients discussed how the transferred knowledge increased their confidence in the value of the proposed treatment plan and their own ability to adhere to it. The transferred knowledge also helped them understand how their actions align with their goals, increasing their motivation for task engagement. Trainees' praise of patients' progress and efforts also facilitated consistent treatment engagement. A study explored the interplay between attachment, alliance, task adherence, and health-related quality of life in patients diagnosed with lupus (Bennett et al., 2011). Patients with lower attachment-related anxiety and avoidance formed stronger alliances with their practitioners. Both alliance strength and patient attachment predicted task adherence and health-related quality of life

(Bennett et al., 2011). Future research should investigate how the interplay between patient attachment and the alliance impact treatment outcomes in chiropractic care.

4.5.3 Strengths and Limitations

This longitudinal mixed-methods study explored the temporal evolution of patient perspectives on WA progression. The critical realist-informed integration of qualitative and quantitative findings enabled a comprehensive investigation of the interplay between context, mechanisms, and observations. We described the observed trends and explained them by hypothesising the underlying conditions and causal mechanisms which had produced them. While the study contributes to the existing literature, we do not claim that our findings are generalisable to all contexts. The limitations also include the size of the sample and the extent of missing data. Higher numbers with greater statistical power can improve the likelihood of detecting a true effect of the interaction between time and attachment. In our results, the interaction effect was close to the level of statistical significance, implying further investigation is needed to understand whether the effect of attachment insecurity is time dependent. We engaged in reflexivity, ensuring that the methodology is transparent and can be replicated by other researchers. Future studies should explore alliance progression from the perspective of patients from diverse cultural backgrounds, including racially minoritised communities. This can enhance our understanding of the impact of sociocultural contexts on individual beliefs, expectations, experiences, interpretations of alliance progression.

4.5.4 Conclusions

The patient-practitioner alliance has been repeatedly shown to be associated with clinical outcomes, notably in treatments for musculoskeletal pain. WA progression is a dynamic process occurring in a preexisting context shaping the actions of the people operating within it. The study explored this process through the lens of patients receiving chiropractic care in a teaching clinic. The initiation of WA was evident early on, despite individual differences in patients' views on the three features – bonds, goals, and tasks. Over time, perspectives on WA progression were shaped by the interplay of patients' evaluations of the factors they had identified as essential and the perceived progress towards their goals. Interconnectedness between the features was illustrated, especially in the role of established bonds in the context of collaboration on both treatment goals and tasks. The quantitative findings suggest that patients' attachment-related anxiety and avoidance can have a statistically significant negative

relationship with their appraisal of the bond throughout care. Nonetheless, the qualitative findings demonstrate that the agency of the trainee chiropractors continuously influenced patients' perspectives. Understanding the role of attachment can contribute to evidence-based practice by informing practitioners about the underlying psychological mechanisms driving patients' thoughts and behaviours on both conscious and subconscious levels.

4.6 Author's Note

Here, I elaborate on existing perspectives on the therapeutic relationship documented in the literature. This offers a deeper understanding of the varied alliance conceptualisations, enabling readers to interpret this study's findings more effectively. Generally, there is an ongoing debate about what constitutes the patient-practitioner relationship, with some scholars differentiating the types of emotional bonds developed in treatment. Initially, as described by Greenson (1971), the therapeutic relationship included the WA, transference and countertransference, and the real relationship, i.e. the patient-practitioner personal connection (Greenson, 1971). He proposed a clear distinction between these three elements, describing the conflicting demands that each element places on the practitioner's technical abilities. Likewise, Gelso and Kline (2019) argue that conceptualising the alliance and the real relationship as separate but closely related constructs is theoretically sound and clinically practical (Gelso & Kline, 2019). They propose that these two constructs contribute distinctively to the treatment process and its outcomes. The real relationship emphasises realism and authenticity, involving genuine interactions and realistic perceptions between the practitioner and the patient. Gelso and Kline (2019) suggest that real relationships and alliances develop in tandem, mutually reinforcing each other. Patients are more likely to engage in treatment when they feel a personal bond with the practitioner, and a strong bond fosters a sense of personal rapport and affinity.

Gelso and Kline (2019) also emphasise the importance of the alliance and the real relationship as protection against potentially harmful transference reactions from the patient. They recommend separating the alliance's working bond from the real relationship's personal bond in assessment tools. For instance, they find an issue with the WAI and its adaptations (Horvath & Greenberg, 1986), as it comprises a bond subscale that combines the working aspect of the bond with the personal one. They recommend separating these items in the inventory by removing personal bond items. An alternative suggestion is to create a four-factor model of the general alliance, i.e. the therapeutic relationship, which includes the personal bond, the working bond, the agreement on goals, and the agreement on tasks. A new measure could be developed to capture these elements. However, it would not be referred to as a WAI but rather a general alliance or relationship scale. The key point is that the real or personal relationship should be conceptualised and measured separately from the working bond, the agreement on goals, and the agreement on tasks (Gelso & Kline, 2019).

Safran and Muran (2006) argue that isolating the alliance from the transferential may result in overlooking essential relational dynamics. Their conceptualisation aligns with Bordin's, suggesting that the therapeutic relationship consists of an emotional bond, agreed-upon goals, and a shared commitment to the treatment tasks (Muran & Barber, 2011; Newhill et al., 2003). They also highlight the possibility that what appears to be a positive alliance could reflect the patient's unconscious resistance or compliance (Safran & Muran, 2006). They identify two types of ruptures: confrontation ruptures, in which the patient openly discusses relationship concerns, and withdrawal ruptures, in which the patient responds by withdrawing, delaying, or complying. In other words, a seemingly positive alliance may actually be a subtle withdrawal rupture.

However, Safran and Muran (2006) also note that their approach does not directly address the issue that earlier perspectives on alliance emphasise conscious or rational collaboration while underestimating the influence of unconscious factors. They argue that Bordin's theory effectively addresses the issue by sidestepping the question of whether the collaborative process is conscious or unconscious, rational or irrational (Bordin, 1979, 1994). Instead, his theory prioritises the quality of the therapist-patient emotional bond and the ongoing collaboration on treatment tasks and goals. It describes alliance development as an evolving negotiation that continually shapes the alliance's strength (Safran & Muran, 2006). Bordin (1994) proposed that the nature of the alliance may differ depending on the treatment approach, with the patient-practitioner power dynamics and the role of the three alliance features varying based on the underlying context. He defined the patient-practitioner bond as the emotional connection between the two parties, recognising its importance while emphasising the need for further investigation on its role and nature (Bordin, 1994). His theory sets the stage for examining alliance development by describing this process as dynamic (Bordin, 1979, 1994). However, more research is necessary to enhance our understanding of the three alliance features across various clinical contexts and at different stages of care.

This study's main contributions include 1) exploring alliance progression as a dynamic process influenced by the existing context, 2) providing qualitative insights into patients' perceptions of the three alliance features and how they evolve, and 3) offering quantitative results that shed light on the progression of patient alliance ratings and the relationship between the bond and patient attachment. The latter was achieved by exploring the impact of attachment-related avoidance and attachment-related anxiety, which represent distinct relational fears and unhelpful coping mechanisms resulting from early relationship experiences.

Chapter 5 General Discussion

Chapter 5 of the thesis provides an overview and discussion of the key findings from the three papers presented in the previous chapters. The first objective is to offer a comprehensive summary of the results from the systematic review, the qualitative study, and the mixed methods longitudinal study. The second objective is to discuss the theoretical and practical implications of the findings. The third objective is to integrate these findings in a graphic visualisation of key insights. Finally, this chapter will also reflect on the strengths and limitations of the thesis.

5.1 Findings from the Mixed Methods Systematic Review

The mixed methods systematic review included sixteen quantitative, seven qualitative and seven mixed method studies to investigate the alliance construct in the chiropractic literature. The review integrated the findings via a convergent segregated approach. The quantitative component was synthesised to describe how previous studies have measured the construct and to explore the impact of the alliance on clinical outcomes and patient satisfaction. The qualitative component was synthesised to understand patient and chiropractor perspectives on the nature and role of the alliance in chiropractic care.

The narrative synthesis of quantitative data found that very few studies have quantitatively measured the construct and its impact, with insufficient homogenous data to conduct a meta-analysis. While several studies indirectly link the dimensions of alliance, i.e. bonds, goals, and tasks, to patient satisfaction in chiropractic care, explicit measurement of its impact on clinical outcomes is lacking. The thematic synthesis of qualitative data resulted in five themes: 1) Chiropractic care as a change process, 2) Chiropractic treatment as collaboration, 3) Communication, 4) Patient-centredness as agreement on values, preferences, and needs, and 5) Trust. The findings suggest that chiropractic care can be considered as a change process, where strong alliances ensure its cooperative nature.

Effective communication between chiropractors and patients is crucial for building mutual understanding and trust. Generally, patients expect to understand the proposed treatment plan and its connection to their goals, highlighting the role of knowledge transfer throughout care. Communication techniques aimed at patient-centred interactions can foster positive bonds.

Conversely, conflicts may arise due to differences in opinion or lack of attentiveness, emphasising the importance of active listening and addressing patient concerns promptly.

Patient-centred care, characterised by respect for person's values, preferences, and needs, fosters collaboration and trust between chiropractors and patients. Personal knowledge of each patient's history and conditions enables practitioners to tailor care plans effectively and enhance patients' openness to trust. Patients value chiropractors who listen attentively, understand their concerns and adapt their approach accordingly. While patient-centredness may present challenges, such as managing patient expectations and beliefs, it ultimately contributes to a positive care experience and active participation in decision-making processes.

Trust plays a key role in the alliances between chiropractors and patients. Patients rely on chiropractors' expertise and trustworthiness as professionals, implying the importance of establishing transparent patient-chiropractor dynamics. Additionally, normative expectations, such as the appearance of the office and the use of medical jargon, can serve as symbolic representations of credibility. Patients' trust can be further influenced by chiropractors' honesty, acknowledgment of limitations, and referrals to other healthcare professionals when necessary. Chiropractors, on the other hand, emphasise the importance of transparency, patient empowerment, and active involvement in decision-making.

5.2 Findings from the Qualitative Study

The aim of the qualitative study was to understand the initiation of the alliance between patients and trainee chiropractors in a teaching clinic setting. Patients were interviewed to gather their perspectives and inform evidence-based practice and training development. The interview transcripts of 25 adult patients were analysed using RTA from a CR stance.

Four themes described the formation of participants' first impressions and alliance initiation, highlighting the importance of building patients' confidence in their trainee chiropractors and the upcoming care journey. The findings illustrated the role of the clinical context in shaping alliance initiation. Factors such as the clinic's reputation, the thorough assessments, and the role of tutors influenced participants' perceptions. Patients valued self-confidence and perceived expertise in trainee chiropractors. Self-confidence, when balanced with humility, was seen as essential for alliance initiation. Perceived expertise, demonstrated through

comprehensive explanations, knowledge, and skills, also influenced patients' trust in the trainee chiropractors.

Trainees' explanations played a vital role in developing early alliance, impacting patients' confidence and understanding of the treatment plan. Patients emphasised the importance of comprehensive explanations in helping them feel involved in the decision-making. Explanations also helped patients comprehend and relate to the trainees' thought process behind the proposed treatment plan, thereby building their confidence in the care journey. Moreover, explanations enabled appropriate adherence to the treatment plan. Participants expressed the need for trainee chiropractors to demonstrate exercises and provide feedback to ensure correct implementation. Explanations also helped them grasp new insights about their bodies, leading to immediate lifestyle changes in some cases. Overall, through explanations, mutual agreement on the goals of care was fostered, and collaboration on the treatment plan was continuously negotiated. Patients highlighted the importance of feeling that their own explanations were listened to and validated, particularly in vulnerable or potentially painful situations.

Participants' experiences of pain and vulnerability played a significant role in early alliance development. Fostering trust and mutual agreement on treatment goals were important for patients. Active listening and validation of their pain experiences were essential for enabling a sense of ease during manual interventions. Some participants described how their bodily sensations influenced the process of building a shared understanding of their condition with their trainee chiropractors. They expected the practitioners to be receptive to their needs and feedback, especially in managing the discomfort related to their pain.

5.3 Findings from the Longitudinal Mixed Method Study

The longitudinal mixed-method study aimed to explore patients' perspectives on alliance progression in the context of a teaching clinic. The study employed quantitative and qualitative data to examine how patients' alliance ratings changed over time and their potential association with patients' attachment. The CR stance shaped the study design. A convergent mixed methods approach was used to understand alliance development, considering patients' perspectives and the underlying causal mechanisms through retroduction.

The quantitative results show that patients' attachment-related anxiety and avoidance were negatively associated with their ratings of the bond throughout care. The multiple regression

analyses revealed that higher attachment-related anxiety and avoidance predicted lower ratings of the trainee-patient bond throughout care. This insight is crucial because the qualitative findings illustrate that the bond was seen as a prerequisite for successful negotiation and collaboration on the treatment goals and tasks. However, the findings further reveal how patients' perspectives on the bond were shaped by trainee's agency, suggesting that the negative impact of attachment-related anxiety and avoidance can be potentially minimised.

Some patients described general faith in healthcare providers and viewed trainee chiropractors as the experts, which made them more inclined to follow their recommendations. Trainee chiropractors were perceived as responsible for leading the negotiation process, offering guidance, and seeking feedback to identify potential challenges or areas of discomfort. The experts were expected to determine the exact cause of patients' symptoms, and chiropractic care was expected to result in concrete improvements. At first, patients viewed their role in treatment as providing feedback on how the recommended tasks affected their symptoms. However, over time, patients' views integrated the role of adherence, describing the treatment as a collaborative effort.

Patients' initial impressions of trainees' expertise were influenced by preconceived notions, satisfaction with trainees' explanations, and trainees' perceived self-confidence. Over time, patients' evaluations of trainees' expertise were also shaped by the progress made towards their goals. The level of comfort patients felt was influenced by trainees' person-centred approach, active listening, consideration, and validation of concerns, as well as their willingness to answer questions and provide reassurance. Maintaining a friendly but professional attitude also contributed to patients' ease. If patients felt at ease, they often developed a strong rapport with the trainees, which improved collaboration over time.

Patients' initial level of trust in trainees was influenced by preconceived ideas of trust formation and past experiences with chiropractic care. After the first clinical encounter, trust was shaped by patients' confidence in trainees' expertise and the level of comfort they felt. Over time, patients' perceptions of progress towards their goals also influenced their level of trust. Trust facilitated successful collaboration, particularly in the context of manual interventions.

Patients had expectations when it came to establishing mutually agreed-upon objectives. If patients had a specific goal in mind, they wanted to feel validated and confident in the proposed treatment plan. If patients sought help to alleviate pain, they expected trainees to identify the root cause. Initially, patients' confidence in the established goals of care was based on their

evaluation of trainees' expertise. If the goals had not been achieved over time, these evaluations impacted patients' reactions (e.g. continuing care or seeking help from a different professional). Trainees' explanations enabled patients to have realistic expectations of potential outcomes. If an agreement on a realistic timescale had been established early on, patients were satisfied even when the progress was slower than they had initially hoped for.

Patients' views on task collaboration showed that the bond, including patients' evaluation of trainees' expertise, facilitated negotiation and enabled the transfer of knowledge, thus increasing patients' confidence in the value of the proposed treatment plan and their own ability to adhere to it. The transferred knowledge also helped patients understand how their actions aligned with their goals, increasing their motivation for task adherence. Trainees' feedback, including consistent reassurance and acknowledgement of patients' progress and efforts, also facilitated collaboration.

5.4 Theoretical and Practical Implications

This thesis emphasised the significance of studying under-researched psychological aspects of musculoskeletal care, namely the patient-practitioner alliance. A strong patient-practitioner alliance is a key aspect of patient-centred care (Langberg et al., 2019). The systematic literature review found that most quantitative research measured alliance implicitly using tools designed for other purposes. While several studies indirectly link the dimensions of the patient-chiropractor alliance to patient satisfaction, explicit assessment of its impact on clinical outcomes is lacking. This insight underscores the necessity for further investigation of the alliance in the chiropractic profession.

The primary research findings illustrate how the alliance is moulded by the underlying context. Thus, future research exploring interpersonal dynamics in patient-practitioner dyads should take into consideration the broader socio-cultural narratives that inform expectations of the relationship and individuals' roles within it (Hauser, 2023). The exercise of human agency during alliance development is based on one's ability to self-monitor in relation to external circumstances (Elder-Vass, 2010). The potential impact of institutional structures on alliance development encompasses the existing policies and practices within a clinical setting, as evidenced by the role of the thorough first assessments and tutors' supervision in alliance initiation. In short, the patient-practitioner alliance is influenced by the prevailing conditions that shape the way both parties behave and interpret each other's actions.

In Western cultures, patients often have preconceived faith in the knowledge and skills embodied by the practitioner (Bolton, 2000). In the qualitative study, patients described their prior beliefs about the role of healthcare providers in general. These beliefs shaped their expectations of trainee chiropractors before the first clinical encounter. The results showed that trainee chiropractors' self-confidence and perceived expertise were vital for early alliance formation. In the presence of a health-related problem, the patient turns to the practitioner because of their appeal as an expert. It can be argued that the responsibility of the practitioner is to provide evidence for their qualities of trustworthiness, i.e., expertise, sincerity, ability, and effectiveness, to distract from the possibility that their actions are motivated by personal gains and not the patient's benefit (Bolton, 2000). Mostly, patient-practitioner relationships are problem-oriented and based on recognised differences in power dynamics. This can create challenges for the practitioner, who should balance their role as a gatekeeper to specialised knowledge with the need to demonstrate trustworthiness and sincerity (Bolton, 2000).

Overall, this thesis illustrates that patients' views on the alliance were based on the extent to which they feel confident in their chiropractor's expertise and trustworthiness, the perceived accuracy of the diagnosis, and the perceived utility of the proposed treatment plan. The qualitative study found that alliance initiation involves a process of building patients' confidence in their choice to seek a chiropractor's help to alleviate their symptoms. Likewise, the longitudinal mixed methods study found that the mutual agreement on the goals of care was continuously shaped by three key factors: 1) patients' expectations, 2) their confidence in trainees' expertise, and 3) the trainees' explanations. According to patients, trainee chiropractors demonstrated their expertise by consistently providing clear and satisfactory explanations. A potential challenge to the alliance is navigating the uncertainty that arises in clinical practice. Patients' need to feel confident in the upcoming care journey is likely a reflection of the uncertainty underlying the diagnosis and treatment of musculoskeletal conditions. This calls for a practitioner who can handle uncertainty in a psychologically informed manner by identifying, validating, and managing the patient's concerns within a secure and trusting relationship.

Scholars describe different types of uncertainty in clinical practice, such as healthcare system uncertainty, clinical uncertainty, ethical uncertainty, relational uncertainty, personal uncertainty, knowledge exchange-related uncertainty, epistemic uncertainty, and parameter uncertainty (Prashanti et al., 2022). A qualitative study utilised reflexive thematic analysis of fifteen semi-structured interviews to explore how patients manage uncertainty while seeking

care for LBP (Costa, Butler, et al., 2023). The findings show that participants felt uncertain about practitioners' abilities and willingness to help them effectively manage their LBP. They also highlighted concerns stemming from inconsistent messages from different healthcare providers. The described uncertainties about being taken seriously from practitioners appeared to be linked to trust, emphasising the significance of establishing a safe and respectful treatment environment. This highlights the need for practitioners to be self-reflective, considering how patients might perceive their actions and the potential consequences of their questions and practices. Participants felt more assured when practitioners listened to and acknowledged their concerns, fostering a sense of partnership and active listening to alleviate uncertainties (Costa, Butler, et al., 2023). The authors concluded that transparency about uncertainty, building a shared understanding, and creating and revisiting treatment plans are crucial elements in delivering effective care (Costa, Butler, et al., 2023).

In this thesis, the importance of a strong alliance was emphasised in relation to patients' experience of pain and the related sense of vulnerability. It comes as no surprise that the bond was a prerequisite for negotiation and collaboration on the treatment goals and tasks. The strong patient-practitioner bond can make patients feel safer and more supported during times of uncertainty (Connolly, 2022). Some patients shared that continuous reassurance during manipulation reduced their uncertainty about manual interventions and alleviated their concerns. The mixed methods study found that when seeking relief from their pain, patients expected that trainee chiropractors will identify the root cause. For instance, a participant who doubted their trainee's ability to provide a definite answer considered seeking help from a more experienced practitioner. However, the findings also suggest that trainees who are able to offer comprehensive explanations can help patients have reasonable expectations. When patients were informed of a realistic timeframe early on, they tended to be satisfied even if their progress was slower than their initial hopes.

Diagnostic uncertainty in practitioners can be defined as a *"subjective perception of an inability to provide an accurate explanation of the patient's health problem"* (Bhise et al., 2018). A study employed semi-structured interviews and delved into the issue of diagnostic uncertainty from the perspective of 17 new graduate physiotherapists (Almond et al., 2021). The findings suggest that new graduate physiotherapists are challenged by diagnostic uncertainty and find this phenomenon to be an uncomfortable yet inevitable feature within their practice. This highlights the importance of clinical-based learning opportunities and workplace support in the development of effective coping skills to navigate diagnostic uncertainty in musculoskeletal

pain. Scholars propose that additional training on strategies to communicate diagnostic uncertainty could prove advantageous and lead to better quality of care and improved decision making (Almond et al., 2021).

A study used ethnographic observations to examine the role of uncertainty in LBP care, specifically how practitioners manage accompanying emotions and tension (Costa, Olson, et al., 2023). The authors observed clinical encounters in both a private physiotherapy practice and a public multidisciplinary pain clinic. During these encounters, patients and practitioners expressed uncertainty about the causes of LBP, imaging findings, and prognosis. Patients often assumed that practitioners had biomedical explanations and expected definitive answers. Practitioners either challenged these expectations by discussing the uncertainties surrounding these factors or provided answers rooted in biomedical reasoning, perpetuating power norms that position practitioners as the authority. However, this approach can be problematic, as it can overlook the emotional toll that uncertainty takes on patients and move away from person-centred approaches. Without certainty, patients felt paralysed and out of control, while practitioners struggled to manage their discomfort and maintain their expertise. By neglecting the complexities surrounding LBP, practitioners risk overrating treatment effectiveness and omitting potential treatment risks (Costa, Olson, et al., 2023).

A qualitative study explored the experiences of uncertainty among UK Musculoskeletal First Contact Practitioners working in primary care (Ingram et al., 2023). The findings show that uncertainty had an impact on practitioners' wellbeing, potentially leading to burnout and retention issues. The study also explored ways in which the practitioners mitigate uncertainty. Using patient-centred approach to explore patient concerns was deemed an effective way to address uncertainty within consultations. The ability to tolerate uncertainty was considered a fundamental skill of a practitioner, and further training in this area could prove helpful. Although some participants noted that becoming more comfortable with uncertainty may take time, the learning opportunities provided by their role were seen as a positive shift in mindset towards uncertainty. The authors emphasise the need to teach practitioners how to identify uncertainty and develop strategies to minimise it, rather than trying to eliminate it entirely (Ingram et al., 2023).

A qualitative study with 22 practitioners treating patients with LBP highlighted the uncertainties associated with patients' unique circumstances (Costa et al., 2022). Practitioners acknowledged that evidence-based guidelines imply early return to work aids in recovery,

identifying psychosocial factors reduces the risk of chronicity, and changing lifestyle behaviours reduces pain. Upon reflection, they shared that these practices did not always apply when considered within patients' contexts. The findings suggest that dealing with uncertainty may involve a shift from being aware of personal and social contexts to finding out what to do with them. When applied to individual consultations, practitioners need to contextualise guideline recommendations to complex psychosocial aspects such as navigating patients' fears and financial pressures. Encountering patients' challenging emotions in practice, practitioners often experience uncertainty. This uncertainty is not inherently problematic when managed competently and sensitively. Instead of offering an illusion of control or certainty, some practitioners discussed *"riding"* uncertainty with their patients. The authors acknowledge that practitioners must operate within the scope of their expertise but argue that it is crucial to prioritise the patient's psychological wellbeing in all areas of practice since it is intimately related to the quality of care (Costa et al., 2022).

This thesis illustrates that a patient-chiropractor alliance requires both a mutual understanding and SDM. According to a study conducted among chiropractors in the UK, less than 70% of the respondents expressed confidence in building a strong alliance, displaying authentic empathy, involving the patient in decision making, and seeking their perspective (Sherriff et al., 2023). Only 53.8% of the practitioners reported feeling self-confident in exploring the subjective meaning of the patient's symptoms (Sherriff et al., 2023). A scoping review analysed 99 studies to explore whether and to what degree the patient's perspective is obtained during SDM in clinical practice (Rake et al., 2022). The findings demonstrated that the elicitation of a patient's preferences occurs on a very low level. Non-biological topics such as psychological wellbeing or one's financial situation are often overlooked. To address this, the authors proposed three steps. First, they created a new term, personal perspective elicitation, which moves beyond obtaining a patient's treatment preferences. The term was described as the disclosure of information relating to a patient's personal preferences, values, and/or context, whether it is solicited by the practitioner or spontaneously expressed by the patient. Second, the authors suggest that it is necessary to identify the reasons behind the low degree of personal perspective elicitation in SDM conversations. Third, they highlighted the need for interventions enhancing the extent of personal perspective elicitation and its integration into the care plan (Rake et al., 2022).

In order to foster strong alliances, provide patient-centred care, and ensure SDM, chiropractors should be transparent about uncertainty. The findings from a narrative review of studies

exploring uncertainty in clinical practice emphasise that honest communication about uncertainty is both morally and ethically necessary (Simpkin & Armstrong, 2019). The authors suggest that practitioners should share the degree of uncertainty associated with each diagnosis. Although some practitioners may feel uncomfortable, sharing uncertainty with patients can improve their engagement and satisfaction. However, communicating uncertainty requires skill and training, and patients may have complex emotional and cognitive responses to it (Simpkin & Armstrong, 2019). The role of uncertainty in the context of chiropractic care should be better understood from the perspective of patients and chiropractors. In this thesis, the patients valued their trainee's demonstration of active listening, validation, reassurance, encouragement, and praise. This implies chiropractors should attend to psychological aspects of the care they deliver, responding to patients' emotional states in a psychologically informed manner.

Patients' experiences of uncertainty can trigger processes that promote learning and adaptation (Hauke & Lohr, 2022). Therefore, it is essential to embrace such challenges as a catalyst for personal development (Esteves et al., 2022). The role of the practitioner is to help patients re-evaluate their existing beliefs and attitudes, facilitating the adaptation of new behaviours and the restoration of productive agency. The results of the primary research found that patients emphasised the importance of trainee's comprehensive explanations at the start and end of care. Initially, the role of explanations was focused on building patients' confidence in the expertise and trustworthiness of their practitioner. In the concluding stages, patients viewed chiropractic care as a process of collaborative efforts. They described how the transferred knowledge had increased their understanding of how their actions align with their goals. Elaborating on their own efforts, they valued the received advice and support in planning the long-term management of their symptoms. It can be argued that chiropractors can help patients understand their pain by coproducing new narratives about how their physical abilities have changed and the implications for their daily routines. This is done through a strong alliance, where both parties work together to understand how the patient's experience of pain affects their life (Esteves et al., 2022).

Scholars highlighted the importance of patient-practitioner alliances in promoting self-management for individuals with musculoskeletal conditions during a focused symposium on patient-centred care (Hutting et al., 2022). Other recommendations for clinical practice included supporting patients in overcoming their biopsychosocial barriers and achieving their goals. The topics covered during this support should include acceptance and management of

pain, disability, exacerbations, emotions, fatigue, and stress. Furthermore, physical barriers to recovery such as load management and a graduated exercise program of adequate dosage should be addressed. Lifestyle factors such as physical activity, sleep, weight control, nutrition, and relaxation should also be discussed. Unhelpful cognitions and misconceptions should be identified and addressed. Lastly, work participation should be discussed, including communication, ergonomics, assertiveness, and social support. It is important to provide ongoing support even after the initial treatment period has ended. This support can be provided through digital means, booster sessions, or review sessions (Hutting et al., 2022).

The longitudinal mixed methods study found that the emotional bond, comprised of the patients' confidence, ease, and trust in their trainee chiropractor, was a prerequisite for successful negotiation and collaboration on the treatment goals and tasks. Higher scores in patients' attachment-related anxiety and avoidance were associated with lower ratings of the bond throughout care. This implies patient attachment can play a significant role in their engagement with treatment. Evidence suggests that individuals with secure attachment (i.e., low attachment-related anxiety and avoidance) are more likely to engage with and participate in treatment than those with insecure attachment (Adams et al., 2018). Furthermore, a longitudinal study found that patients with insecure attachment experienced limited long-term benefits from a multimodal pain therapy compared to patients with secure attachment (Pfeifer et al., 2018). The authors emphasised the role of direct and indirect attachment-related mechanisms in pain management, implying insecure attachment can be seen as a psychosocial risk factor for the chronification of acute pain (Pfeifer et al., 2018). Considering that patients' appraisals of the bond in this thesis were shaped by trainees' agency, it could be argued that practitioners' efforts to foster strong bonds with their patients can minimise the potential impact of insecure attachment on treatment engagement and clinical outcomes.

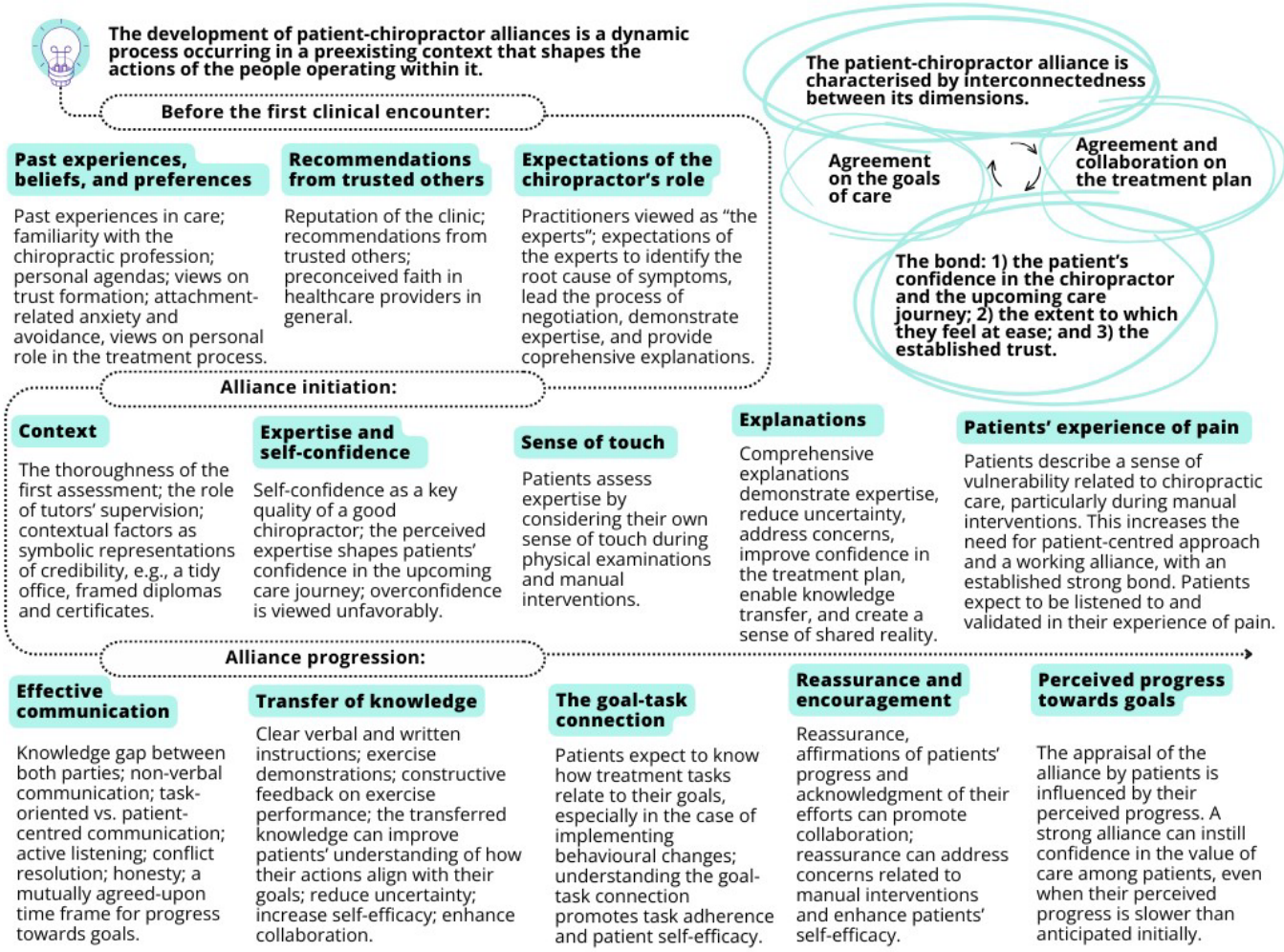
A recent study explored the relationship between adult insecure attachment and anxiety, i.e., excessive worry about potential threats (Çarıkçı-Özgül & Işık, 2024). The researchers examined the role of two subtypes of insecure attachment - avoidant and anxious - and how intolerance of uncertainty and perceived social support may mediate this relationship. The findings indicated that individuals with insecure attachment tend to experience stronger intolerance of uncertainty and anxiety. Perceived social support had negative associations with both avoidant and anxious attachment. The mediation analysis revealed that intolerance of uncertainty played a mediating role in the relationship between anxious attachment and anxiety. However, this was not found to be the case for avoidant attachment. Avoidant attachment patterns often stem from

childhood experiences where attachment figures were not reliably present when needed (Cassidy & Shaver, 2016). This can lead individuals with trust issues to shy away from relationships and social networks to avoid uncertainty. Interestingly, the study found that the level of perceived social support can act as a mediator between avoidant attachment and anxiety (Çarıkçı-Özgül & Işık, 2024). Overall, these results provide valuable insights into the complex interplay between attachment insecurity, intolerance of uncertainty, perceived social support, and excessive worry about potential threats (Çarıkçı-Özgül & Işık, 2024).

5.5 Visualisation

Figure 5.1 provides a graphic illustration of the key insights from the thesis, including an outline of the main factors shaping the dynamic process of alliance development in chiropractic care.

Figure 5.1 Chiropractor-Patient Working Alliance



5.6 Strengths and Limitations

This thesis demonstrates a significant strength in utilising a mixed-methods methodology, which offered valuable insights into a critical yet under-researched aspect of chiropractic care. The research employed a critical realist-informed integration of qualitative and quantitative findings to examine the interplay between context, mechanisms, and observations. The studies aimed to hypothesise the underlying conditions and causal mechanisms that led to the observed trends. The data analyses considered how patients' views were shaped by their past experiences and expectations, sociocultural norms, the clinical setting, and trainees' actions. The longitudinal mixed-methods study provided a more comprehensive understanding of the dynamic process of alliance progression. Reflexivity was employed to ensure transparency in the methodology for potential replication by other researchers.

In the qualitative study, the realist-informed TA was structured around three interrelated types of themes: experiential, inferential, and dispositional (Wiltshire & Ronkainen, 2021). While the process typically moves through the types of themes in order, it is recognised that all three types of themes are likely to be considered throughout, which can aid in a more thorough analysis. The analysis involved data-driven coding, deductive and inductive thinking, and abductive and retroductive reasoning. One potential limitation of the study is that, due to practical constraints, interview transcripts and themes were not returned to participants for accuracy verification. Experiential themes describe participants' intentions, feelings, and beliefs. Providing experiential themes to participants ensures empirical adequacy (whether data support the themes) and interpretive validity (whether they closely represent participants' experiences). This step is beneficial because it allows participants to confirm whether the themes accurately reflect their lived experiences, helping to identify any misunderstandings or gaps. Feedback from participants may prompt revisions, leading to greater descriptive validity. Inferential themes, which involve broader inferences beyond participants' direct experiences, and dispositional themes, which theorise about unobservable causal mechanisms, are not typically verified by participants. However, exposing them to experiential themes ensures that these inferences remain grounded in valid interpretations of their experiences. In summary, it is good practice for participants to review the experiential themes to ensure that the foundational elements of the analysis - the interpretations of their experiences - are accurate, leading to more valid and reliable research findings (Wiltshire & Ronkainen, 2021).

Our study utilised the model developed by Malterud and colleagues to establish the sample size (Malterud et al., 2016). According to the model, a sample with more pertinent information necessitates fewer participants. The sample size is contingent upon the study's objective, sample specificity, incorporation of established theory, quality of dialogue, and analysis strategy. One potential limitation was the limited dialogue due to the brevity of the four interviews, which lasted approximately 10 minutes each. Two interviews were truncated due to participants' time constraints, while two were brief because of succinct participant responses. As a result, we concluded that the necessary sample size should be increased. After careful consideration of the study's objectives, sample specificity, and analysis strategy, we determined that a sample of 25 participants would yield sufficient information power to investigate alliance initiation.

Notably, the observed impact of the teaching clinic on alliance development may not necessarily directly apply to non-teaching environments, but it does underscore the significant influence of the underlying context. Future research could greatly benefit from delving into the perspectives of trainee chiropractors and how their expectations and previous experiences impact their agency. It is important to note that trainees typically spend more time with patients than licensed chiropractors, particularly during the initial assessment. Further investigation involving licensed chiropractors could offer deeper insights into alliance development in non-teaching settings and how the duration of sessions influences patients' viewpoints. Additionally, our research indicates that patients adjust their expectations based on the level of qualification of the chiropractors. For instance, patients anticipated some level of nervousness in the trainees, but the perceived self-confidence still influenced alliance initiation. Licensed chiropractors will likely demonstrate higher self-confidence than trainees.

Next, investigating how alliance development may vary in a qualified chiropractor's private practice, where treatment costs are typically higher, would be valuable. The cost of treatment can influence patients' expectations regarding their involvement in the treatment process. For example, some individuals may place the responsibility for treatment outcomes solely on the chiropractor, stating: "*I paid her to fix my back. I didn't pay her to teach me how to fix my back*" (Stilwell & Harman, 2017b). Further research is necessary to observe how alliance development would differ in self-funded versus NHS-funded chiropractic care. Notably, 67% of CAM use in the UK is self-funded, while only 13% is financed by the NHS (Sharp et al., 2018). Financial obligations can create barriers for individuals from less privileged backgrounds to access treatment. This could result in research involving predominantly affluent, well-educated

participants or from a specific demographic. Due to subsidised fees, the teaching clinic environment allowed for examining the alliance across multiple trainees and a more diverse patient population.

Nonetheless, all participants in this research were of a White ethnic background. The homogeneity of the sample is a critical factor to consider when interpreting the findings. Considering the observed influence of sociocultural norms on patients' expectations, future studies must include participants from marginalised backgrounds. Such investigations can uncover disparities in the perspectives of patients and practitioners. Prior research has identified race-related variations in the clinician-client relationship, which, in turn, impact client retention (Torres et al., 2022). For instance, it was observed that clinicians from White backgrounds rated the alliance as weaker when working with Black clients compared to their White counterparts. Conversely, clinicians from Black backgrounds rated their alliance as stronger (relative to White clinicians) for both White and Black clients (Torres et al., 2022). Access to quality healthcare can vary based on race, and healthcare providers may have biases that affect the patient-practitioner relationship (Maharaj et al., 2021). Cultivating cultural humility is paramount as efforts to enhance practitioners' capacity to build positive alliances with diverse populations are necessary.

Cultural humility encompasses both interpersonal and intrapersonal dimensions, involving a willingness to reflect on one's own cultural context and to comprehend the cultural context and identities of clients (Orlowski et al., 2024). Rather than assuming the universality of one's cultural knowledge, a culturally humble practitioner approaches client culture and identity with curiosity and respect. A systematic literature review synthesised prior research on the association between therapist cultural humility, alliance quality, and psychotherapy outcomes (Orlowski et al., 2024). The analysis demonstrated a statistically significant positive correlation between cultural humility and alliance quality and a smaller yet significant positive association between cultural humility and psychotherapy outcomes. While moderators related to client race, gender, and sexual orientation were also examined, no significant associations were found. It is essential to foster cultural humility among practitioners, and further research involving patients from marginalised backgrounds can contribute to evidence-based practice (Orlowski et al., 2024).

The longitudinal mixed-methods study employed LMMs, a powerful tool for handling missing data in longitudinal or repeated measures studies (Murphy et al., 2022). Unlike traditional

models, LMMs can effectively manage unbalanced data, where the number of observations per participant varies due to missing data. This flexibility makes LMMs well-suited for real-world research settings where missing data is common. LMMs address the issue of intra-subject correlation in data with repeated measures by modelling individual-level variability through random effects. This allows for a more accurate estimation of fixed effects while appropriately handling the dependency between repeated observations within participants. In our analysis, we incorporated participant-specific random effects, allowing for flexible data modelling with varying numbers of observations per participant. Our complete model included fixed effects for time and attachment, enabling us to investigate the overall relationship between these predictors and the dependent variable. We also examined the interaction between time and attachment to evaluate how the effect of attachment on alliance might change over time. We used a top-down exploratory strategy for linear mixed models to simplify the model while retaining its explanatory power systematically (Zuur et al., 2009). This approach allowed us to start with a comprehensive model and gradually eliminate non-significant terms to avoid overfitting while identifying the model that best represented the data (Yan et al., 2014). Study limitations include the sample size and extent of missing data. A higher statistical power can improve the likelihood of detecting a true effect of the interaction between time and attachment. Future research should investigate whether the effect of attachment is time-dependent.

The measurement tools used to assess the alliance construct pose a potential challenge for research. The COSMIN guideline for systematic reviews of PROMs provides a methodology to evaluate the methodological quality of studies on measurement properties and the quality of the PROM itself (Prinsen et al., 2018). This approach allows for transparent conclusions and evidence-based recommendations regarding the quality of PROMs for use in both research and clinical practice. Despite over three decades of research on the WAI and its adaptations, a systematic review following the COSMIN guideline revealed that evidence for the measurement properties was frequently inadequate, lacking, or conflicting (Paap et al., 2022).

Content validity, which evaluates the accuracy of a measurement instrument in reflecting the intended construct, was assessed in 25 studies after the development of the WAI in 1989, with 32 adaptations under examination (Paap et al., 2022). Only one out of the 25 studies on content validity evaluated all necessary aspects, with most lacking patient and professional involvement. Additionally, four studies reported ceiling effects, indicating limited response variability across items or domains. According to COSMIN criteria, no studies provided

sufficient evidence of content validity, leaving it undetermined. Fifty-one studies used various analyses to report structural validity, which assesses how well a measurement reflects the dimensionality of the construct. Conflicting results emerged, with 22 studies supporting a three-factor structure, 16 supporting a two-factor structure, and other structures also reported. Only four studies met COSMIN criteria for sufficient structural validity. Internal consistency, which examines the interrelatedness of items within a measurement, was examined in 52 studies using Cronbach's alpha. While many studies reported alpha values > 0.70, most did not meet the criteria for sufficient structural validity. Only one study achieved both. Cross-cultural validity, which examines whether different cultural groups interpret items similarly, was investigated in seven studies, with inconsistent findings across cultural groups and longitudinal sessions. Methodological issues, such as unclear statistical methods and insufficient sample sizes, led to doubtful or insufficient ratings (Paap et al., 2022).

Overall, none of the WAI studies have provided conclusive evidence for content validity or internal consistency across all domains (Paap et al., 2022). Despite numerous studies exploring structural validity, conflicting results and methodological issues hinder firm conclusions. This suggests that WAI outcomes should be interpreted cautiously, and further research is needed to assess its content validity and hypotheses development. The authors note that using COSMIN criteria influenced the review of the WAI, but it can blur the line between poor methodological quality and poor reporting. The COSMIN method counts the lowest score for assessing overall study quality, potentially leading to an inadequate overall rating even if most aspects of the study are strong. Insufficient or low-quality evidence for WAI's measurement properties should not automatically be interpreted as proof of insufficiency. More comparative studies with other alliance instruments are needed. While COSMIN criteria help review PROMs, there is a need for methodological discussions about their appropriateness, especially in psychological research. An international consensus study (e.g., using the Delphi method) could explore whether the criteria need adaptation for this field (Paap et al., 2022).

5.7 Conclusions

The impact of the patient-practitioner alliance on treatment outcomes is well-documented in physical health context, but scholars have noted that future research should gain theoretical insights that can be applied to clinical practice. The main goal of the thesis was to explore alliance development in chiropractic care. The mixed methods systematic literature review

synthesised existing studies on the alliance construct in the chiropractic literature. The objectives included 1) describing the views of patients and chiropractors on the nature and role of the alliance, 2) examining how the construct has been measured, and 3) exploring the alliance-outcome relationship. The thematic synthesis produced five themes: 1) Chiropractic care as a change process, 2) Chiropractic treatment as collaboration, 3) Communication, 4) Patient-centredness as agreement on values, preferences, and needs, and 5) Trust. The findings propose that chiropractic care can be regarded as a change process, where strong alliances can ensure its cooperative nature. The narrative synthesis revealed that only a few studies have quantitatively measured WA. Although some studies indirectly associate alliance dimensions (i.e., bonds, goals, and tasks) with patient satisfaction, there is no explicit measurement of its impact on clinical outcomes. The review illustrates that the patient-chiropractor alliance is an under-researched aspect of chiropractic care.

The qualitative study explored the initiation of alliances from the perspective of patients receiving chiropractic care. Its objective was to understand how patients' first impressions and views on the alliance are formed in a chiropractic teaching clinic context. The study highlights the importance of building patients' confidence in their trainee chiropractors and the upcoming care journey. Patients valued self-confidence and perceived expertise in trainee chiropractors, as well as comprehensive explanations of the treatment plan, including exercise demonstration and feedback. Patients’ experience of pain and vulnerability played a significant role in early alliance formation, and active listening and validation of their concerns were essential for establishing trust and comfort, especially during manual interventions.

The mixed-methods longitudinal study explored the temporal evolution of patients' perspectives on alliance progression. Its objectives included examining how patients' WA ratings changed over time, evaluating the potential association between patient attachment and WA ratings, and understanding how patients' views on each WA dimension have evolved throughout their care. The progression of the alliance was evident early on, despite individual differences in patients' views on the three dimensions - bonds, goals, and tasks. As time passed, patients' views on alliance development were influenced by how they evaluated the factors they deemed crucial and the progress they made towards their goals. The interconnectedness between the dimensions was highlighted, especially regarding the role of established bonds in the context of collaboration on treatment goals and tasks. Patients' attachment-related anxiety and avoidance could negatively impact their assessment of the bond throughout treatment. Nevertheless, the study demonstrated that patients' views were continuously shaped by the actions of their

trainee chiropractors. Understanding the role of attachment can aid evidence-based practice by providing practitioners with insights into the underlying psychological mechanisms driving patients' thoughts and behaviours.

Based on the primary research findings, it is evident that the patient-chiropractor alliance is shaped by the broader context within chiropractic care. The prevailing conditions that influence the actions and perceptions of both parties play a critical role in alliance development. Furthermore, the thesis highlights that patients' perceptions of the alliance depend on factors such as the chiropractor's expertise, trustworthiness, accuracy of diagnosis, and efficacy of the treatment plan. Given the uncertainty underlying musculoskeletal care, chiropractors who can manage uncertainty, handling it in a psychologically informed manner by identifying, validating, and addressing patients' concerns within a secure and trusting relationship, are crucial. The link between attachment-related anxiety and avoidance and the bond implies that patient attachment also plays a role. Scholars should explain the underlying mechanisms that shape the attachment-alliance interplay and assess its effects on clinical outcomes. Notably, any future research on patient-practitioner dynamics should consider the broader socio-cultural narratives that shape individuals’ agency within the relationship. The thesis underscores the value of adopting a critical realist stance to understand patient-chiropractor alliances.

Appendix A Participant Information Sheet

Participant Information Sheet

Study Title: How Does The Chiropractor-Patient Working Relationship Develop During Care

Researcher: Dima Ivanova

ERGO number: 74271

Please read on to find out why we are doing this study and what it involves. To help you decide whether to take part you may like to talk to others. If you want to talk to us, the researchers, or ask us some questions, please email d.ivanova@soton.ac.uk or phone 02380594980. If you want to take part, you can tell us by answering the next questions after this page.

What is the research about?

My name is Dima Ivanova. I am a student at the University of Southampton and this study is part of the PhD I am doing in Psychology. The purpose of this research is to understand more about your relationship with your chiropractor and how it develops over the time you spend here at the clinic. The results from the project will be helping education providers, chiropractors and researchers.

Why have I been asked to participate?

Because you are a patient at AECC University College (AECCUC). I am hoping to find 400 people over the age of 18 who are seeking chiropractic treatment at the teaching clinics.

Are there any benefits in my taking part?

You will be rewarded with a £10 Sainsbury's voucher when you agree to take part. Taking part in this project will also give you the chance to share your experiences and help the researchers.

What will happen to me if I take part?

To take part you will complete some short web-based surveys. You can complete them on your

phone, tablet or laptop. If you prefer, you can complete the study on paper, just ask me or the receptionist at the clinic for a paper copy.

You will need to do one 10-minute long survey after your first visit to the clinic. Then you will need to do a 5-minute long survey after every chiropractic treatment until the end of your care. You will be sent a reminder when it is time to fill in the surveys. If you need any help, I will help you.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part.

Will my participation be confidential?

Your chiropractor will not know if you are taking part in this study or not. Your participation and the information we collect about you during the course of the research will be kept strictly confidential. You will be asked at the end of this page whether you would like to find out more details about how your data will be protected.

Thank you for taking the time to read this information.

Yours Sincerely,

Dima Ivanova

d.ivanova@soton.ac.uk

Participant Information Sheet (Date: 10.03.2023 Version: 2.2)

Appendix B Consent Form

Please select Yes or No to indicate if you agree with the following statements regarding your participation in the survey.

Table 5.1 Consent Form

Statement	Yes	No
I have read and understood the participant information sheet (Date: 10.03.2023 Version: 2.2) and have had the opportunity to ask questions about the study.		
I agree to take part in the questionnaire study and agree for my data to be used the purposes set out in the participation information sheet.		
I understand my participation is voluntary and I may withdraw from this research project at any time for any reason without my participation rights being affected.		
I understand that if I withdraw from the study that it may not be possible to remove the data once my personal information is no longer linked to the data.		
I understand that personal information (name, gender identity, age, education level, reason for seeking chiropractic care, previous experiences with chiropractic care, any comorbidities, and cotreatments) will be collected about me to achieve the objectives of the research project.		
I agree for the AECC University College clinic to share my appointment dates with the research team.		

Appendix C Research Flyer

Research Flyer

Is this your first visit to the clinic at AECCUC in the last year?

Evidence shows that the relationship between a practitioner and a patient has impact on the outcomes of treatment. A team from the University of Southampton is looking for participants for a research project exploring this relationship between chiropractors and their patients.

- The study will involve short questionnaires after your appointments.
- You will be offered a £10 Sainsbury's voucher for your time.
- We are looking for individuals who are above the age of 18 and attending the clinic for a first time.

How to contact the research team?
If you want to know more about this opportunity to share your preferences, please:

1) scan the QR code on the right,
2) Visit https://southampton.qualtrics.com/jfe/form/SV_encahqJ1SDDs0TA
3) email us at: d.ivanova@soton.ac.uk
4) or call 02380594980

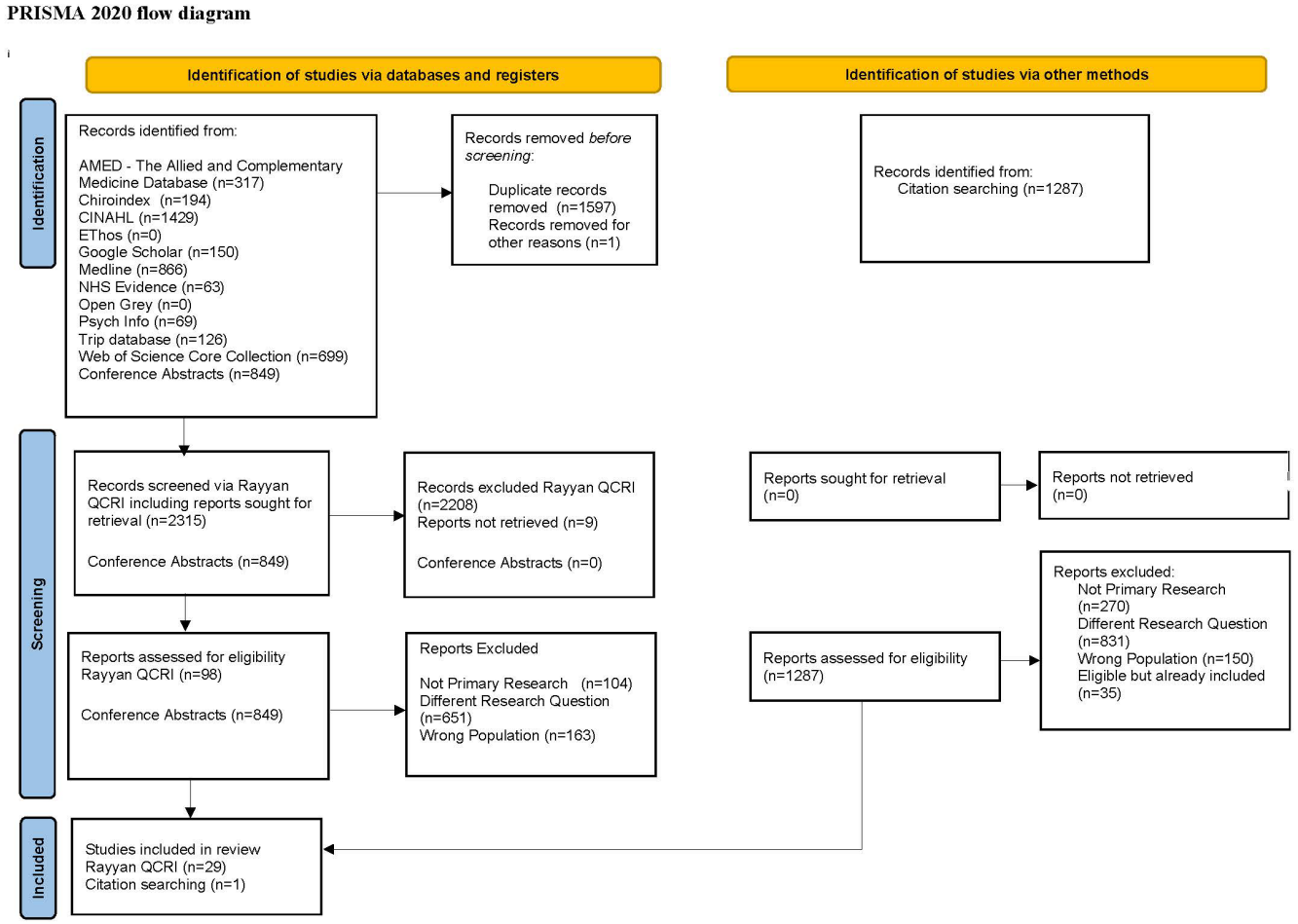
University of Southampton

Study Title: How does Working Alliance Develop During Care
ERGO Number: 74271 Date: 20.09.2022 Version: 2.1
Researcher: Dima Ivanova End of Recruitment: December 2022

Please scan the QR code to find out more about the study.

Appendix D PRISMA Flow Diagram

Figure 5.2 PRISMA Flowchart



i The screening of Conference Abstracts and Citation searching was conducted manually instead of using Rayyan.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: http://www.prisma-statement.org/ cvcv

Appendix E Quality Appraisal

Table 5.2 Quality Appraisal

	Criteria from the Mixed Methods Appraisal Tool																								
Author(s) and Date	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**4.1**	**4.2**	**4.3**	**4.4**	**4.5**	**5.1**	**5.2**	**5.3**	**5.4**	**5.5**
Alcantara, Ohm et al. 2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	1	1	n/a	n/a	n/a	n/a	n/a
Bolton 2000	1	1	2	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Boudreau, Busse et al. 2006	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a
Cherkin and MacCornack 1989	1	1	2	2	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	1	2	2	2	2

Connell and Bainbridge 2020	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	2	1	1	1	1	1	1
Connor, Bernstein et al. 2021	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Crowther 2014	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dagenais and Haldeman 2012	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a
Fikar, Edlund et al. 2015	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	0	1	n/a	n/a	n/a	n/a	n/a
Foley, Steel et al. 2020	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	0	1	n/a	n/a	n/a	n/a	n/a
Gaumer 2006	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a
Gemmell and Hayes 2001	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	0	2	n/a	n/a	n/a	n/a	n/a
Haas, Vavrek et al. 2014	n/a	n/a	n/a	n/a	n/a	1	1	1	0	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Hertzman-Miller, Morgenstern et al. 2002	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hurwitz, Morgenstern et al. 2005	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jamison 1996	1	1	2	0	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	2	1	1	2	2	2	2
Jamison 2000	1	1	2	0	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	1	2	1	1	2
Lambers and Bolton 2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	0	1	n/a	n/a	n/a	n/a	n/a
Maiers and Salsbury 202	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mior 2010	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	1	1	1	1	1	1	1
Marchiori, Henkin et al. 2008	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	2	1	n/a	n/a	n/a	n/a	n/a
Oths 1994	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	1	1	1	1	1	1	1

Pincus, Foster et al. 2007	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a
Sadr, Pourkiani-Allah-Abad et al. 2012	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Salsbury, Vining et al. 2018	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sawyer and Kassak 1993	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	`1	1	1	1	n/a	n/a	n/a	n/a	n/a
Sigrell 2002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	2	1	n/a	n/a	n/a	n/a	n/a
Sims 2009	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a
Stilwell and Harman 2017	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stuber, Langweiler et al. 2018	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	1	2	1	1	1	1	1	1

Captions: The questions are as follow: (1.1) Is the qualitative approach appropriate to answer the research question? (1.2) Are the qualitative data collection methods adequate to address the research question? (1.3) Are the findings adequately derived from the data? (1.4) Is the interpretation of results

sufficiently substantiated by data? (1.5) Is there coherence between qualitative data sources, collection, analysis and interpretation? (2.1) Is randomization appropriately performed? (2.2) Are the groups comparable at baseline? (2.3) Are there complete outcome data? (2.4) Are outcome assessors blinded to the intervention provided? (2.5) Did the participants adhere to the assigned intervention? (3.1) Are the participants representative of the target population? (3.2) Are measurements appropriate regarding both the outcome and intervention (or exposure)? (3.3) Are there complete outcome data? (3.4) Are the confounders accounted for in the design and analysis? (3.5) During the study period, is the intervention administered (or exposure occurred) as intended? (4.1) Is the sampling strategy relevant to address the research question? (4.2) Is the sample representative of the target population? (4.3) Are the measurements appropriate? (4.4) Is the risk of nonresponse bias low? (4.5) Is the statistical analysis appropriate to answer the research question? (5.1) Is there an adequate rationale for using a mixed methods design to address the research question? (5.2) Are the different components of the study effectively integrated to answer the research question? (5.3) Are the outputs of the integration of qualitative and quantitative components adequately interpreted? (5.4) Are divergences and inconsistencies between quantitative and qualitative results adequately addressed? (5.5) Do the different components of the study adhere to the quality criteria of each tradition of the methods involved? The answer options are 1 – yes, 0 – no, and 2- Can't tell.

Appendix F Mixed Methods Systematic Review Tables

F.1 Summary of Studies Included in the Qualitative Synthesis

Table 5.3 Summary of Studies Included in the Qualitative Synthesis

Study Reference	Country	Participants	Data Collection Methods	Data Analysis Methods
(Bolton, 2000)	US	trained and licensed chiropractor in a small town in the American Midwest	ethnographic case-report	not explicitly specified, but the healing performance of a chiropractor is proposed to contain four intrinsic claims to trustworthiness
(Cherkin & MacCornack, 1989)	US	20 patients at the Group Health Cooperative of Puget Sound.	discussion groups	information for the qualitative analysis and findings was limited
(Connell & Bainbridge, 2020)	Canada	6 chiropractors licensed with the College of Chiropractors of British Columbia	interviews	thematic analysis
(Connor et al., 2021)	US	15 randomly selected participants from the 29 participants randomised to the chiropractic group	interviews	grounded theory approach

Study Reference	Country	Participants	Data Collection Methods	Data Analysis Methods
(Crowther, 2014)	Canada	197 participants were recruited from 20 participating chiropractors in Ontario	interviews using Flanagan's Critical Incident Technique.	inductive content analysis
(Jamison, 1996)	Australia	208 patients were observed	recording duration of all patient-practitioner interactions was recorded, some were audiotaped, notes taking	thematic analysis
(Jamison, 2000)	Australia	9 chiropractors and 173 patients	interviews	data were analysed by comparing the responses of individual patients with those of their practitioner in each of 173 case studies.
(Maiers & Salsbury, 2021)	US	171 participants part of a randomised control trial	interviews	interactive approach to qualitative content analysis
(Mior, 2010)	Canada	6 focus groups, a total of 69 patients.	focus group sessions	qualitative content analysis (an interpretive approach)
(Oths, 1994)	US	a male family chiropractor and a sample of 57 people, who made a total of 104 office visits between them	data were collected through 1) audiotape of all clinical interaction of the chiropractor for eight days, 2) formal and informal interviews with the chiropractors., his staff, and patients	data were content analysed using the modified Bales method of process analysis (Bales, 1976)
(Sadr et al., 2012)	Canada	11 chiropractors and nine patients	interviews	grounded theory approach
(Salsbury et al., 2018)	US	60 participants in the Crotched Mountain	individual interviews or focus groups	thematic content analysis

Study Reference	Country	Participants	Data Collection Methods	Data Analysis Methods
(Stilwell & Harman, 2017b)	Canada	3 female patients and 3 male patients in the Halifax metro area, Nova Scotia, Canada	focused ethnographic approach involving 16 semi-structured interviews	a systematic approach for analysing ethnographic data developed by Roper and Shapira (Roper & Shapira, 2000)
(Stuber et al., 2018)	Canada	90 participants were recruited from two private chiropractic clinics in Calgary, Alberta, Canada	interviews	thematic analysis

F.2 Summary of Studies Included in the Quantitative Synthesis

Table 5.4 Summary of Studies Included in the Quantitative Synthesis

Study Reference	Country	Participants	Methods of Data Collection	Methods of Data analysis
(Alcantara et al., 2016)	US	343 pregnant patients	questionnaires	descriptive statistics and the paired t test
(Boudreau et al., 2006)	Canada	69 military personnel presenting for on-site chiropractic services	questionnaire	multivariable regression model
(Cherkin & MacCornack, 1989)	US	20 patients with LBP	questionnaires	Student's t-test
(Connell & Bainbridge, 2020)	Canada	6 chiropractors licensed with the College of Chiropractors of British Columbia	questionnaire	descriptive statistics
(Dagenais & Haldeman, 2012)	US	20 institutions provided a written copy of the Informed consent documents	retrieving Informed Consent (IC) documents	IC were compared against a list of requirements
(Fikar et al., 2015)	UK	509 participants from four participating UK associations	telephone survey	Pearson Chi-Square tests
(Foley et al., 2020)	Australia	153 patients with chronic conditions	questionnaires	descriptive and summary statistics
(Gaumer, 2006)	US	1759 adults in the US population	questionnaire	descriptive and multivariate methods

Study Reference	Country	Participants	Methods of Data Collection	Methods of Data analysis
(Gemmell & Hayes, 2001)	US	66 questionnaires were returned from new and established patients	questionnaire	not explicitly specified
(Haas et al., 2014)	US	400 participants with chronic LBP	questionnaire	path analysis
(Hertzman-Miller et al., 2002)	US	681 patients randomized, 341 were assigned to the 2 chiropractic groups	questionnaires at baseline and 2 weeks of treatment	mixed linear modelling
(Hurwitz et al., 2005)	US	same trial as in the study of Hertzman-Miller et al. (2002)	questionnaires	multiple logistic and linear regression modelling
(Jamison, 1996)	Australia	144 patients seeing chiropractors with practices in diverse locations	questionnaires	not explicitly specified
(Jamison, 2000)	Australia	9 chiropractors and 173 patients participated	questionnaires	descriptive statistics
(Lambers & Bolton, 2016)	The Netherlands	89 chiropractors, 207 patient-chiropractor working relationships	questionnaires	a one-way ANOVA (analysis of variance) test
(Marchiori et al., 2008)	US	72 chiropractors who worked in 61 chiropractic practices	questionnaire	regression analysis
(Mior, 2010)	Canada	2597 patients participating in a collaborative study	questionnaires	a multiple linear regression model
(Oths, 1994)	US	a sample of 57 people, who made a total of 104 office visits between them	1) audiotape of all clinical interaction of the chiropractor for eight days 2) patient questionnaires pertaining to satisfaction with care	1) data were content analysed using the modified Bales method of process analysis (Bales 1976). 2) descriptive statistics

Study Reference	Country	Participants	Methods of Data Collection	Methods of Data analysis
(Pincus et al., 2007)	UK	465 practitioners of which 132 chiropractors (28%)	questionnaires	several multivariate analyses of variance (ANOVA)
(Sawyer & Kassak, 1993)	US	541 new and returning chiropractic patients	questionnaires	multiple stepwise regression analysis
(Sigrell, 2002)	Sweden	30 chiropractors and 336 patients from 17 private practices	questionnaires	the Wilcoxon signed rank test
(Sims, 2009)	US	62 chronic pain patients recruited from four chiropractic offices	questionnaires	series of multiple regression analyses
(Stuber et al., 2018)	Canada	90 participants were recruited from two private chiropractic clinics	questionnaire	descriptive statistics

F.3 Measuring Working Alliance

Table 5.5 Measuring Working Alliance

Study Reference Number	How was WA measured?	Which tool was used?
(Alcantara et al., 2016)	Specific items in the visit-specific satisfaction questionnaire implicitly measured WA.	The RAND VSQ9 is a 9-item questionnaire adapted by the American Medical Group from the Visit Rating Questionnaire used in the RAND Medical Outcomes Study (Health).
(Boudreau et al., 2006)	Specific items in the satisfaction questionnaire implicitly measured WA.	The 27-item satisfaction questionnaire used for this study was adapted from the chiropractic satisfaction survey (Sawyer & Kassak, 1993).
(Cherkin & MacCornack, 1989)	Specific items in the satisfaction questionnaire implicitly measured WA.	Satisfaction questionnaire designed for this study.
(Connell & Bainbridge, 2020)	The study measured chiropractors' perception of trust, which implicitly explored one of WA's features (bond).	The survey was created following qualitative analysis to verify emerging themes related to chiropractors' perceptions of trust.
(Dagenais & Haldeman, 2012)	The study evaluated questions for informed consent, which implicitly measured two features of WA (agreement on goals and tasks)	A list of questions was developed by the principal authors based on what they believe an educated patient considering chiropractic management of

Study Reference Number	How was WA measured?	Which tool was used?
		LBP would want to know before making an informed decision about their care and providing their informed consent.
(Fikar et al., 2015)	The survey assessed behaviour patterns' of chiropractors' 1) goal setting, 2) reevaluating progress with their patients. and 3) the discussion of addressing lifestyle issues. This study implicitly explored two features of WA (agreement on goals and tasks).	Survey designed for this study.
(Foley et al., 2020)	This study measured patient-centred care during consultation with practitioners, which implicitly explored two features of WA (agreement on goals and tasks).	Patient-Centred Care Scale and the Patient Assessment of Chronic Illness Care
(Gaumer, 2006)	Specific items in the satisfaction questionnaire implicitly measured WA.	A national telephone satisfaction survey.
(Gemmell & Hayes, 2001)	Specific items in the satisfaction questionnaire implicitly measured WA.	A visit-specific questionnaire that included a set of 9 items adapted from the Group Health Association of America Visit-Specific Questionnaire.
(Haas et al., 2014)	Authors explored the DPE, which implicitly measured WA.	Satisfaction Questionnaire by Cherkin and colleagues (Cherkin & MacCornack, 1989).
(Hertzman-Miller et al., 2002)	Specific items in a satisfaction questionnaire implicitly measured WA.	Satisfaction Questionnaire by Cherkin and colleagues (Cherkin & MacCornack, 1989).

Study Reference Number	How was WA measured?	Which tool was used?
(Hurwitz et al., 2005)	This is the same trial as in the study of Hertzman-Miller and colleagues (Hertzman-Miller et al., 2002).	
(Jamison, 1996)	Mixed method study explicitly exploring WA.	The quantitative component used a closed-question questionnaire to assess the perceptions and experiences of patients.
(Jamison, 2000)	Exploring the congruence of patient-practitioner perceptions implicitly measured two features of WA (agreement on goals and tasks).	A patient questionnaire and a practitioner questionnaire.
(Lambers & Bolton, 2016)	The study explicitly measured WA.	The Werkalliantievragenlijst (Stinckens et al., 2009).
(Marchiori et al., 2008)	Exploring social communication skills of practicing chiropractors implicitly assessed aspects of WA.	Riggio's Social Skills Inventory (SSI) (Riggio, 1986, 2005; Riggio et al., 2003).
(Mior, 2010)	The study evaluated key aspects of the care provided to patients, and some of the items assessed implicitly WA.	The Primary Care Assessment Survey
(Oths, 1994)	The study explored WA implicitly via examining chiropractors' communication and interaction patterns.	All taped verbal dialogue between the practitioner and his patients was content analysed using the modified Bales method of process analysis (Bales, 1976).
(Pincus et al., 2007)	The study investigated the attitudes to back pain using a recently developed and validated questionnaire. This	The Attitudes to Back Pain Scale for musculoskeletal practitioners

Study Reference Number	How was WA measured?	Which tool was used?
	implicitly explored two features of WA (agreement on goals and tasks).	
(Sawyer & Kassak, 1993)	Specific items in the satisfaction questionnaire implicitly measured WA.	Satisfaction questionnaire.
(Sigrell, 2002)	The study explored the expectations of new patients consulting a chiropractor and to evaluated differences and similarities in expectations between chiropractors and patients. This implicitly measured two features of WA (agreement on goals and tasks).	Questionnaires.
(Sims, 2009)	Explored how attached or connected patients feel toward their chiropractor, which implicitly measured one of WA's features (bond).	Physician-Patient Attachment Scale (Winterowd, 2007).
(Stuber et al., 2018)	The study assessed patient-centred care in patients with chronic health conditions attending chiropractic practice. This study implicitly assessed two features of WA (agreement on goals and tasks).	A modified version of the Patient Assessment of Chronic Illness Care (Glasgow et al., 2005).

F.4 How was the Working Alliance Measured in the Literature

Table 5.6 How was the Alliance Measured in the Literature

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
(Alcantara et al., 2016)*	Implicitly	Agreement on tasks and the bond.	The RAND VSQ9 (Ware & Sherbourne, 1992).	Explanation of what was done to you? Technical skills (thoroughness, carefulness, and competence) of the physician/ healthcare professional you saw? The personal manner (courtesy, respect, sensitivity, and friendliness) of the person you saw?
(Boudreau et al., 2006)*	Implicitly	All three features.	The 27-item satisfaction questionnaire used for this study was adapted from the chiropractic satisfaction survey (Sawyer & Kassak, 1993).	All of my questions were answered by my chiropractor. My chiropractor did his best to keep me from worrying about my problem. My chiropractor was interested in all my health problems. My chiropractor treated me with respect and concern.

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
				My chiropractor made me feel foolish. My chiropractor didn't give me suggestions on what I could do to help my problem. My chiropractor gave me advice on how to prevent health problems from occurring. I think that my chiropractor should have spent more time. My chiropractor acted as though I was important. I feel I had to see my chiropractor more than I should have. My chiropractor was very careful to check everything when examining me.
(Sawyer & Kassak, 1993)*	Implicitly	All three features.	Satisfaction questionnaire.	My doctor was interested in all my health problems. All of my questions were answered by my doctor. My doctor treated me with respect and concern. My doctor did not give me suggestions on what I could do to help my problem.

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
(Cherkin & MacCornack, 1989)*	Implicitly	All three features.	Satisfaction questionnaire designed for this study	My doctor seemed to believe my pain was real. Provider gave instructions on back exercise. Strongly agree I knew what to do to take care of my back after my visit. Provider seemed confident that the treatment s/he recommended would work. Provider understood my concerns about the cause of my pain.
(Connell & Bainbridge, 2020)	Implicitly	Bond.	The survey was created following qualitative analysis to verify emerging themes related to chiropractors' perceptions of trust.	To what extent do you agree with the following statements: Chiropractors who are honest are more likely to form trust with their patients. My patients are more likely to trust me if I'm authentic. Understanding my patient's body language can help me understand if they trust me. I believe that clear communication is a way to build trust with patients.

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
(Dagenais & Haldeman, 2012)	Implicitly	Agreement on goals and tasks.	A list of questions was developed by the principal authors based on what they believe an educated patient considering chiropractic management of LBP would want to know before making an informed decision about their care and providing their informed consent.	Example questions: What could go wrong with this treatment? What are the specific goals of this treatment?
(Fikar et al., 2015)	Implicitly	Agreement on goals and tasks.	Survey designed for this study to explore behaviour patterns of chiropractors.	The items were organised into categories, namely, nutrition, physical activity, psychosocial well-being, smoking and alcohol consumption. Behaviour patterns such as goal setting, revaluating progress with patients, and discussing lifestyle issues were examined.
(Foley et al., 2020)	Implicitly	Agreement on goals and tasks.	Patient-Centred Care Scale and the Patient Assessment of Chronic Illness	Asked to talk about my goals in caring for my condition. Helped to set specific goals to improve my eating or exercise. Asked for my ideas when we made a treatment plan. Given choices about treatment to think about.

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
(Gaumer, 2006)*	Implicitly	All three features.	A national telephone satisfaction survey.	Satisfaction with particular aspects of the chiropractor: Provides good advice about staying healthy and preventing illness. Provides effective advice for routine problems and illnesses. Effective in diagnosing serious problems and recommending action. Explains health problems and choices available. Willing to refer to appropriate specialists when necessary. Orders and interprets appropriate laboratory tests. Concerned about me as a person and my overall health. Extent of personal involvement in health care decision making: Participate in health care decision making but rely heavily on provider. Responsible for own health decisions, but value provider's advice.

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
				Generally, make own health care decisions.
(Gemmell & Hayes, 2001)*	Implicitly	All three features.	A visit-specific questionnaire that included a set of 9 items adapted from the Group Health Association of America Visit-Specific Questionnaire.	Patients were asked to indicate how satisfied they are by answering questions relating to time spent with the provider, explanation of what was done, technical skills of the provider, personal manner of the provider, and the visit overall. Examples were not provided.
(Haas et al., 2014)	Implicitly	All three features.	Satisfaction Questionnaire by Cherkin and colleagues (Cherkin & MacCornack, 1989).	Measures of the doctor-patient encounter included patient perception of chiropractor enthusiasm for care, comfort treating LBP, confidence in care success, and adequate time spent with the patient. An example question was "My doctor seemed enthusiastic about my treatment program".
(Hertzman-Miller et al., 2002)*	Implicitly	All three features.	The study measured satisfaction using the questionnaire by Cherkin and colleagues (Cherkin & MacCornack, 1989). Also, the authors measured the provision of self-care	An example item relevant to WA from the Information subscale is "The doctor gave me enough information about the cause of my pain", while the Caring subscale contained items such as "My doctor seemed to believe my pain was real".

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
			advice and if the chiropractor explained the treatment plan.	Self-care advice was measured by summing how many of 10 specified types of advice the subject reported having received from their primary provider. The explanation-of-treatment variable was the subject's answer (yes or no) to the question "Did your provider explain your LBP treatment plan (for example, did he or she tell you how often you should schedule visits)?".
(Hurwitz et al., 2005)*	This is the same trial as in the study of Hertzman-Miller and colleagues (Hertzman-Miller et al., 2002).			
(Jamison, 1996)	Explicitly.	All three features.	The quantitative component used a closed-question questionnaire to assess the perceptions and experiences of patients.	Patients could circle items such "overwhelmed, down, understood, trapped, hopeful, etc." to describe their current and expected feelings relating to chiropractors' care. They could also circle statements describing their opinion on items such as "I feel that my chiropractor is interested in". For this item, the options were "my problem" or "me, the person" etc.

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
				Regarding suggestions for improving chiropractic care, patients could indicate if they wanted their practitioner to spend more time "listening to their concerns", etc.
(Jamison, 2000)	Implicitly	Agreement on goals and tasks.	A patient questionnaire and a practitioner questionnaire.	The items assessed the concurrence of patient-practitioner perceptions with respect to the patient's stress levels, the importance of injury as a causative factor in the presenting symptom and the responsibility the patient should take "in getting themselves well." Examples were not provided.
(Lambers & Bolton, 2016)	Explicitly	All three features.	The Werkalliantievragenlijst (Stinckens et al., 2009)	Items in the questionnaire were in Dutch. Each questionnaire consisted of twelve statements, reflecting patients' experiences with respect to collaboration in reaching agreement on treatment goals (goal dimension), agreement on treatment strategies (task dimension) and on the existence of an affective bond (bond dimension).
(Marchiori et al., 2008)	Implicitly.	Bond.	Riggio's Social Skills Inventory (SSI) (Riggio, 1986, 2005; Riggio et al., 2003).	The inventory used recognises three basic types of skills in communication: expressivity, sensitivity, and control. These

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
				skills operate in two realms: the nonverbal and the verbal domain. An example scale of SSI is Emotional Sensitivity scale which measures the skills in receiving and interpreting the nonverbal communications of others with items such as "People often tell me that I am a sensitive and understanding person."
(Mior, 2010)	Implicitly	All three features.	The Primary Care Assessment Survey (PCAS).	The PCAS subscales relevant to WA were 1) Knowledge of patient, 2) Communication, 3) Interpersonal treatment, and 4) Trust. Example item is "Thinking about the personal aspects of the care you receive from your regular chiropractor, how would you rate the following" and then followed by "Chiropractor's caring and concern for you".
(Oths, 1994)	Implicitly	All three features.	All taped verbal dialogue between the practitioner and his patients was content analysed using the modified Bales method of process analysis (Bales, 1976).	The speech categories were combined to form three mutually exclusive indices: '

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
				"Positive Affect" consists of statements characterised by positive feeling or emotion and showing solidarity or tension release. "Information Exchange" includes giving or asking for opinion, and giving or asking for orientation, consisting respectively of task- oriented interpretive or factual statements. "Negative Affect" index subsumes all statements coded as showing disagreement, tension, or antagonism.
(Pincus et al., 2007)	Implicitly	Agreement on goals and tasks.	The Attitudes to Back Pain Scale for musculoskeletal practitioners (ABS-mp)	I explore the psychological problems that my patient is facing. I often find myself providing psychological support to patients. It is essential that I know about my patients' psychological difficulties.
(Sigrell, 2002)	Implicitly	Agreement on goals and tasks.	Questionnaires.	"I expect that the chiropractor will explain what is wrong" - for patients

Study Reference	Is Working Alliance measured implicitly or explicitly?	Which Bordin's Working Alliance feature is measured?	Which tool was used?	Example Items
				"I expect to explain to the patient what the problem is" - for chiropractors.
(Sims, 2009)	Implicitly	Bond.	Physician-Patient Attachment Scale (PPAS) (Winterowd, 2007).	My physician listens to what I have to say. If my physician knows something is bothering me, they ask me about it. Talking over my problems with my physician makes me feel ashamed or foolish.
(Stuber et al., 2018)	Implicitly	Agreement on goals and tasks.	A modified version of the Patient Assessment of Chronic Illness Care (Glasgow et al., 2005).	Does your chiropractor help you set specific goals that you can work on? Was this done together? What goals did you create with respect to diet or exercise? Were these goals written down as part of a treatment plan?

*Studies exploring patient satisfaction

F.5 The Effect of Working Alliance on Clinical Outcomes and Satisfaction

Table 5.7 The Effect of Working Alliance on Clinical Outcomes and Satisfaction

Study Reference Number	How did the study measure clinical outcomes?	Did the study measure satisfaction? If yes, how?	What did the study find?
(Haas et al., 2014)	LBP intensity, which was a primary study outcome, was assessed using the Modified Von Korff pain scale (Underwood et al., 1999). A path analysis was conducted to determine the effects of dose and doctor-patient encounter (DPE) on LBP intensity at the end of care (6 weeks) and primary end point (12 weeks).	No	The principal finding was that the DPE evaluated at the end of care and Spinal Manipulation Therapy dose had similar effects on pain outcomes. DPE β= −0.22 and − 0.15 and dose β = −0.11 and − 0.12 for the six and 12-week pain outcomes, respectively. Patients' perception of their practitioners' enthusiasm and confidence related to the treatment process may impact the establishment of trust and respect, which underlies the bond between patients and their chiropractor.
(Hurwitz et al., 2005)	At every follow-up assessment: functional status was measured by repeat Roland-Morris Low-Back Disability (Roland & Morris, 1983a, 1983b). Questionnaires, pain status was measured by repeat numerical	Satisfaction with back care was measured on a 40-point scale and observed at 4 weeks following randomisation.	Greater satisfaction increased the odds of remission from clinically meaningful pain and disability at 6 weeks (adjusted odds ratio (OR) for 10-point increase in satisfaction = 1.61, 95% CI = 0.99,2.68), but not at 6, 12, or 18 months (6 months: adjusted OR = 1.05, 95% CI = 0.73, 1.52; 12 months:

Study Reference Number	How did the study measure clinical outcomes?	Did the study measure satisfaction? If yes, how?	What did the study find?
	rating scales and scales of global pain improvement, and pain frequency measured by 6-point ordinal scale.		adjusted OR = 0.94, 95% CI = 0.67, 1.32; 18 months: adjusted OR = 1.07; 95% CI = 0.76, 1.50).
(Mior, 2010)	The *"improved"* variable reflected the patients' subjective report of symptomatic improvement after receiving their treatment: it was dichotomised into two categories, either feeling much better or less than feeling much better after the treatment.	Satisfaction was assessed on a 7-point Likert scale from 1 being 'Completely satisfied, couldn't be better' to 7 being 'Completely dissatisfied, couldn't be worse' from the question: "All things considered, how satisfied are you with your regular chiropractor."	The results of regression analyses suggested that in general, patients who were completely satisfied with their overall chiropractic experience and felt much better following their treatment were positively associated with rating their chiropractor as a high performer on all the PCAS scales (Safran et al., 1998) when controlling for all other variables. For example, the adjusted odds ratio for the effect of being completely satisfied with your chiropractor when controlling for all other variables in the model was 9.97, suggesting a positive association between patients who are completely satisfied with their overall chiropractic experience and rating their chiropractor above the 75th percentile on the Trust in chiropractor scale. Similarly the variable improved was also positively associated with patients rating their chiropractor as a high performer in the Trust in chiropractor scale.

1 The text in this table used phrasing as close as possible to the phrasing used by authors when reporting their studies.

Appendix G Topic Guide

G.1 First Interview

Table 5.8 First Interview

Theme	Questions
Introduction	Thank you for agreeing to take part in this interview. It will last around 45 minutes. Please feel free to pause or stop the interview at any point. As you know, the conversation will be recorded, but your personal information will remain confidential. The aim of the interview is to understand how the relationship between yourself, and your chiropractor develops. This includes how you both relate, make decisions, and work together to achieve the goals of care.
	Do you have any questions before we begin?
General Working Alliance and Expectations	What did you think your chiropractor would be like before you met them?
	And now you have met them, what were your first impressions?
	What qualities do you think are important for a chiropractor? [personal characteristics, professional characteristics/skills]
	What comes to mind when you think about the relationship between you and the chiropractor?
	In your opinion, what would be the role of this relationship during your treatment?
	What do you think is important for this relationship?

Theme	Questions
Agreement and Collaboration	What do you think your role is during the chiropractic treatment?
	What do you want to get out of coming for chiropractic?
	What do you think your chiropractor wants to achieve?
	What was the role of goal setting during your first appointment?
	To what extent were you involved in making decisions during the appointment?
	What do you think would influence this decision-making process?
Patient-Centredness / Individualised Care	What do you expect from your chiropractor to consider when developing your treatment plan?
	In your opinion, what factors in your life would influence your treatment progress?
	How can your chiropractor take them into account?
Communication	What would help you and your chiropractor to communicate effectively?
	How can your chiropractor make you feel heard and understood?
	What could cause tension between you and your chiropractor?
Bond	What can the chiropractor do to gain your trust?
	What do you view as important for the professional bond between you and chiropractor?
Personal and Professional Characteristics	Which of the chiropractor's personal characteristics do you think would influence your relationship?
	Which of the chiropractor's professional skills do you think would influence your relationship?
	Which of your personal characteristics do you think would influence the relationship?

G.2 Second Interview

Table 5.9 Second Interview

Theme	Questions
Introduction	I'm interested in your experiences since we last met. So, some of these questions may sound familiar. Please feel free to pause or stop the interview at any point. As you know, the conversation will be recorded, but your personal information will remain confidential. The aim of the interview is to understand how the relationship between yourself, and your chiropractor has developed over the course of your treatment.
	Do you have any questions before we begin?
General Working Alliance and Expectations	You've now had a number of treatments with your chiropractor. How do you feel about your chiropractor now? In what ways has this changed, if at all, over the course of your treatments?
	What was the role of the relationship between you and your chiropractor during treatment?
	How did your relationship change with time?
	If you think about everything that happened during your chiropractor appointments, what do you think were the really important things?
Agreement and Collaboration	Think about your reasons for seeking chiropractic care.
	What changed as result of your treatment?
	To what extent did your treatment help you achieve your goals?
	What was your role during treatment?

Theme	Questions
	What was your chiropractor's role during treatment?
	How involved were you in making decisions?
Patient-Centredness / Individualised Care	In your opinion, what factors in your personal life influenced your treatment progress?
	To what extent did the treatment plan consider these factors?
	To what extent did the treatment plan consider your preferences?
	What did your chiropractor do to make you feel heard or understood?
Communication	Think back about the conversations you had with your chiropractor during your treatment.
	What is your overall evaluation on the communication between you and your chiropractor?
	What do you think worked well in your communication?
	How do you think the communication could have been improved?
Bond	Think about the emotions which come to mind when you consider the relationship between you and your chiropractor.
	To what extent do you trust your chiropractor now?
	How did your trust change with time?
	What did your chiropractor do to gain your trust?
	In there anything that your chiropractor did to make you distrust them?
	What other emotions come to mind when you think about the relationship with your chiropractor?
Personal and Professional Characteristics	Which personal qualities of the chiropractor influenced your relationship?
	Which professional skills of the chiropractor influenced your relationship?

Theme	Questions
	Which of your personal qualities do you think had a role in the relationship?

Appendix H Working Alliance Inventory – Short Revised

Instructions: Below is a list of statements and questions about experiences people might have with their chiropractic care or chiropractor. Think about your experience in your last appointment, and decide which category best describes your own experience.

IMPORTANT!!! Please take your time to consider each question carefully.

Table 5.10 WAI-SR

Consent Statement	Seldom	Sometimes	Fairly Often	Very Often	Always	Not Applicable
I believe my chiropractor likes me.						
My chiropractor and I collaborate on setting goals for my care.						
My chiropractor and I respect each other.						
My chiropractor and I are working towards mutually agreed upon goals.						
I feel that my chiropractor appreciates me.						
My chiropractor and I agree on what is important for me to work on.						
I feel my chiropractor cares about me even when I do things that he/she does not approve of.						
I feel that the things I do in chiropractic care will						

help me to accomplish the changes that I want.	
My chiropractor and I have established a good understanding of the kind of changes that would be good for me.	
I believe the way we are working with my problem is correct.	
What I am doing in chiropractic care gives me new ways of looking at my problem.	
As a result of this session I am clearer as to how I might be able to change.	

Appendix I Experiences in Close Relationships – Relationships Structures

Please read each of the following statements and rate the extent to which you believe each statement best describes your feelings about close relationships in general.

Table 5.11 ECR-RS

Statement	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
It helps to turn to people in times of need.							
I usually discuss my problems and concerns with others.							
I talk things over with people.							
I find it easy to depend on others.							
I don't feel comfortable opening up to others.							

I prefer not to show others how I feel deep down.

I often worry that other people do not really care for me.

I'm afraid that other people may abandon me.

I worry that others won't care about me as much as I care about them.

List of References

Adams, G. C., Wrath, A. J., & Meng, X. (2018). The Relationship between Adult Attachment and Mental Health Care Utilization: A Systematic Review. *Can J Psychiatry*, *63*(10), 651-660. https://doi.org/10.1177/0706743718779933

AECC University College. (2023). In: https://www.aecc.ac.uk/clinics/clinical-services/student-chiropractic-clinic/.

Ainsworth, M. S. (1989). Attachments beyond infancy. *American Psychologist*, *44*(4), 709.

Alcantara, J., Ohm, J., & Alcantara, J. (2016). The use of PROMIS and the RAND VSQ9 in chiropractic patients receiving care with the Webster Technique. *Complementary therapies in clinical practice*, *23*, 110-116.

Allen, M. L., Cook, B. L., Carson, N., Interian, A., La Roche, M., & Alegría, M. (2017). Patient-Provider Therapeutic Alliance Contributes to Patient Activation in Community Mental Health Clinics. *Administration and Policy in Mental Health and Mental Health Services Research*, *44*(4), 431-440. https://doi.org/10.1007/s10488-015-0655-8

Almond, A., Zou, Y., & Forbes, R. (2021). Navigating diagnostic uncertainty in musculoskeletal practice: The perspectives and experiences of new graduate physiotherapists. *Musculoskelet Sci Pract*, *52*, 102354. https://doi.org/10.1016/j.msksp.2021.102354

Ambady, N., Koo, J., Rosenthal, R., & Winograd, C. H. (2002). Physical therapists' nonverbal communication predicts geriatric patients' health outcomes. *Psychol Aging*, *17*(3), 443-452. https://doi.org/10.1037/0882-7974.17.3.443

Archer, M. S., Bhaskar, R., Collier, A., Lawson, T., Norrie, A. W., & Safari, a. O. R. M. C. (1998). *Critical realism : essential readings* (1st edition. ed.). Routledge. https://www.safaribooksonline.com/complete/auth0oauth2/&state=/library/view//9780415196321/?ar

Aromataris, E., & Munn, Z. (2020). JBI manual for evidence synthesis. *Adelaide: JBI*.

Babatunde, F., MacDermid, J., & MacIntyre, N. (2017). Characteristics of therapeutic alliance in musculoskeletal physiotherapy and occupational therapy practice: a scoping review of the literature. *BMC health services research*, *17*(1), 1-23.

Baier, A. L., Kline, A. C., & Feeny, N. C. (2020). Therapeutic alliance as a mediator of change: A systematic review and evaluation of research. *Clin Psychol Rev*, *82*, 101921. https://doi.org/10.1016/j.cpr.2020.101921

Bales, R. (1976). Interaction process analysis: a method for the study of small groups. 203. In: University of Chicago Press, Chicago.

Balint, E. (1969). The possibilities of patient-centered medicine. *J R Coll Gen Pract*, *17*(82), 269-276.

Bandura, A., Freeman, W. H., & Lightsey, R. (1999). Self-efficacy: The exercise of control. In: Springer.

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Englewood cliffs Prentice Hall.

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, *67*(1), 1 - 48. https://doi.org/10.18637/jss.v067.i01

Beach, M. C., Inui, T., & Network, R.-C. C. R. (2006). Relationship-centered care: A constructive reframing. *Journal of General Internal Medicine*, *21*, 3-8.

Becerra, G., Heard, J., Kremer, R., & Denzinger, J. (2007). Trust attributes, methods, and uses. Proc. Workshop on Trust in Agent Soc. 6th Int. Joint Conf. Autonomous Agents Multiagent Syst.(AAMAS),

Beliveau, P. J. H., Wong, J. J., Sutton, D. A., Simon, N. B., Bussieres, A. E., Mior, S. A., & French, S. D. (2017). The chiropractic profession: a scoping review of utilization rates, reasons for seeking care, patient profiles, and care provided. *Chiropr Man Therap*, *25*, 35. https://doi.org/10.1186/s12998-017-0165-8

Bennett, J. K., Fuertes, J. N., Keitel, M., & Phillips, R. (2011). The role of patient attachment and working alliance on patient adherence, satisfaction, and health-related quality of life in lupus treatment. *Patient Education and Counseling*, *85*(1), 53-59.

Bernecker, S. L., Levy, K. N., & Ellison, W. D. (2013). A meta-analysis of the relation between patient adult attachment style and the working alliance. *Psychotherapy research*, *24*, 12-24. https://doi.org/10.1080/10503307.2013.809561

Bernhardsson, S., Larsson, M. E. H., Johansson, K., & Öberg, B. (2017). "In the physio we trust": A qualitative study on patients' preferences for physiotherapy. *Physiother Theory Pract*, *33*(7), 535-549. https://doi.org/10.1080/09593985.2017.1328720

Bhaskar, R. (1975). 1997. A realist theory of science. *Brighton: Harvester-Wheatsheaf*.

Bhaskar, R. (2013). *A realist theory of science*. Routledge.

Bhaskar, R., & Danermark, B. (2006). Metatheory, Interdisciplinarity and Disability Research: A Critical Realist Perspective. *Scandinavian Journal of Disability Research*, *8*(4), 278-297. https://doi.org/10.1080/15017410600914329

Bhise, V., Rajan, S. S., Sittig, D. F., Morgan, R. O., Chaudhary, P., & Singh, H. (2018). Defining and Measuring Diagnostic Uncertainty in Medicine: A Systematic Review. *J Gen Intern Med*, *33*(1), 103-115. https://doi.org/10.1007/s11606-017-4164-1

Bialosky, J. E., Bishop, M. D., Price, D. D., Robinson, M. E., & George, S. Z. (2009). The mechanisms of manual therapy in the treatment of musculoskeletal pain: a comprehensive model. *Man Ther*, *14*(5), 531-538. https://doi.org/10.1016/j.math.2008.09.001

Bishop, F., Al-Abbadey, M., Roberts, L., MacPherson, H., Stuart, B., Carnes, D., Fawkes, C., Yardley, L., & Bradbury, K. (2021). Direct and mediated effects of treatment context on low back pain outcome: a prospective cohort study. *BMJ open*, *11*(5), e044831.

Bishop, F. L., Massey, Y., Yardley, L., & Lewith, G. T. (2011). How patients choose acupuncturists: a mixed-methods project. *The Journal of Alternative and Complementary Medicine*, *17*(1), 19-25.

Bolton, J. (2000). Trust and the healing encounter: An examination of an unorthodox healing performance. *Theoretical medicine and bioethics*, *21*(4), 305-319.

Bomhof-Roordink, H., Gärtner, F. R., Stiggelbout, A. M., & Pieterse, A. H. (2019). Key components of shared decision making models: a systematic review. *BMJ open*, *9*(12), e031763. https://doi.org/10.1136/bmjopen-2019-031763

Bonnin, J. E. (2014). To speak with the other's voice: reducing asymmetry and social distance in professional–client communication. *Journal of Multicultural Discourses*, *9*(2), 149-171. https://doi.org/10.1080/17447143.2014.890207

Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory, research & practice*, *16*(3), 252.

Bordin, E. S. (1994). Theory and research on the therapeutic working alliance: New directions.

Boudreau, L. A., Busse, J. W., & McBride, G. (2006). Chiropractic services in the Canadian Armed Forces: a pilot project. *Military medicine*, *171*(6), 572-576.

Bourke, E., Barker, C., & Fornells-Ambrojo, M. (2021). Systematic review and meta-analysis of therapeutic alliance, engagement, and outcome in psychological therapies for psychosis. *Psychology and Psychotherapy: Theory, Research and Practice*, *94*(3), 822-853. https://doi.org/https://doi.org/10.1111/papt.12330

Bowlby, J. (1958). The nature of the child's tie to his mother. *The International Journal of Psychoanalysis*, *39*, 350-373.

Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. Basic Books.

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589-597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V., & Clarke, V. (2021). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research in Sport, Exercise and Health*, *13*(2), 201-216. https://doi.org/10.1080/2159676X.2019.1704846

Brouillard, C., Gabbert, F., & Scott, A. J. (2024). Addressing current issues in assessing professional rapport: A systematic review and synthesis of existing measures. *Applied Cognitive Psychology*, *38*(3), e4205. https://doi.org/https://doi.org/10.1002/acp.4205

Burns, J. W., & Evon, D. (2007). Common and specific process factors in cardiac rehabilitation: Independent and interactive effects of the working alliance and self-efficacy. *Health Psychology*, *26*(6), 684.

Butler, S. F., & Strupp, H. H. (1986). Specific and nonspecific factors in psychotherapy: A problematic paradigm for psychotherapy research. *Psychotherapy: Theory, Research, Practice, Training*, *23*(1), 30.

Bzovsky, S., Phillips, M. R., Guymer, R. H., Wykoff, C. C., Thabane, L., Bhandari, M., Chaudhary, V., Sivaprasad, S., Kaiser, P., Sarraf, D., Bakri, S. J., Garg, S. J., Singh, R. P., Holz, F. G., Wong, T. Y., & on behalf of the, R. E. T. I. N. A. s. g. (2022). The clinician's guide to interpreting a regression analysis. *Eye*, *36*(9), 1715-1717. https://doi.org/10.1038/s41433-022-01949-z

Calnan, M. W., & Sanford, E. (2004). Public trust in health care: the system or the doctor? *Quality and Safety in Health Care*, *13*(2), 92. https://doi.org/10.1136/qshc.2003.009001

Cameron, A. (2021). *Registrant Survey 2020*. E. Research. https://www.gcc-uk.org/assets/publications/GCC_Registrant_Survey_2020_-_main_report_final.pdf

Campbell, L., & Stanton, S. C. E. (2019). Adult attachment and trust in romantic relationships. *Current Opinion in Psychology*, *25*, 148-151. https://doi.org/https://doi.org/10.1016/j.copsyc.2018.08.004

Çarıkçı-Özgül, D. N., & Işık, Ü. (2024). Exploring adult attachment and anxiety: the role of intolerance of uncertainty and social support. *Current Psychology*. https://doi.org/10.1007/s12144-024-05659-5

Carney, M. C. (2020). Rupture and Repair in the Therapeutic Alliance: An Attachment Perspective. In *Supervisor*.

Cassidy, J., & Shaver, P. R. (2016). *Handbook of Attachment : Theory, Research, and Clinical Applications*. Guilford Publications. http://ebookcentral.proquest.com/lib/soton-ebooks/detail.action?docID=4338858

Challender, P., & McDermott, P. (2019). The Theory of Trust: Concept, Components, and Characteristics. In *Building Collaborative Trust in Construction Procurement Strategies* (pp. 37-54). https://doi.org/https://doi.org/10.1002/9781119492313.ch3

Chaudhari, N., Ravi, R., Gogtay, N. J., & Thatte, U. M. (2020). Recruitment and retention of the participants in clinical trials: Challenges and solutions. *Perspectives in clinical research*, *11*(2), 64-69. https://doi.org/10.4103/picr.PICR_206_19

Cherkin, D. C., & MacCornack, F. A. (1989). Patient evaluations of low back pain care from family physicians and chiropractors. *Western Journal of Medicine*, *150*(3), 351.

Christian, C., Barzilai, E., Nyman, J., & Negri, A. (2021). Assessing Key Linguistic Dimensions of Ruptures in the Therapeutic Alliance. *Journal of Psycholinguistic Research*, *50*(1), 143-153. https://doi.org/10.1007/s10936-021-09768-1

Ciaunica, A., Constant, A., Preissl, H., & Fotopoulou, K. (2021). The first prior: From co-embodiment to co-homeostasis in early life. *Consciousness and Cognition*, *91*, 103117. https://doi.org/https://doi.org/10.1016/j.concog.2021.103117

Cittern, D., Nolte, T., Friston, K., & Edalat, A. (2018). Intrinsic and extrinsic motivators of attachment under active inference. *PloS one*, *13*(4), e0193955. https://doi.org/10.1371/journal.pone.0193955

Clar, C., Tsertsvadze, A., Court, R., Hundt, G. L., Clarke, A., & Sutcliffe, P. (2014). Clinical effectiveness of manual therapy for the management of musculoskeletal and non-musculoskeletal conditions: systematic review and update of UK evidence report. *Chiropr Man Therap*, *22*(1), 12. https://doi.org/10.1186/2045-709x-22-12

Clarke, V., & Braun, V. (2021). Thematic analysis: a practical guide. *Thematic Analysis*, 1-100.

Clarke, V., Braun, V., & Hayfield, N. (2015). Thematic analysis. *Qualitative psychology: A practical guide to research methods*, *3*, 222-248.

Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and social Psychology*, *58*(4), 644-663. https://doi.org/10.1037/0022-3514.58.4.644

Colloca, L., Klinger, R., Flor, H., & Bingel, U. (2013). Placebo analgesia: psychological and neurobiological mechanisms. *Pain*, *154*(4), 511-514. https://doi.org/10.1016/j.pain.2013.02.002

Connell, G., & Bainbridge, L. (2020). Understanding how chiropractors build trust with patients: a mixed-methods study. *The Journal of the Canadian Chiropractic Association*, *64*(2), 97.

Connolly, P. (2022). Instability and uncertainty are critical for psychotherapy: how the therapeutic alliance opens us up. *Frontiers in Psychology*, *12*, 784295.

Connor, J. P., Bernstein, C., Kilgore, K., Rist, P. M., Osypiuk, K., Kowalski, M., & Wayne, P. M. (2021). Perceptions of chiropractic care among women with migraine: A qualitative substudy using a grounded-theory framework. *Journal of Manipulative and Physiological Therapeutics*, *44*(2), 154-163.

Cosgrove, J., & Hebron, C. (2021). 'Getting them on board': Musculoskeletal physiotherapists conceptions of management of persons with low back pain. *Musculoskeletal Care*, *19*(2), 199-207. https://doi.org/https://doi.org/10.1002/msc.1524

Costa, N., Butler, P., Dillon, M., Mescouto, K., Olson, R., Forbes, R., & Setchell, J. (2023). "I felt uncertain about my whole future"-a qualitative investigation of people's experiences of navigating uncertainty when seeking care for their low back pain. *Pain*, *164*(12), 2749-2758. https://doi.org/10.1097/j.pain.0000000000002975

Costa, N., Mescouto, K., Dillon, M., Olson, R., Butler, P., Forbes, R., & Setchell, J. (2022). The ubiquity of uncertainty in low back pain care. *Social Science & Medicine*, *313*, 115422. https://doi.org/https://doi.org/10.1016/j.socscimed.2022.115422

Costa, N., Olson, R., Mescouto, K., Hodges, P. W., Dillon, M., Evans, K., Walsh, K., Jensen, N., & Setchell, J. (2023). Uncertainty in low back pain care – insights from an ethnographic study. *Disability and Rehabilitation*, *45*(5), 784-795. https://doi.org/10.1080/09638288.2022.2040615

Coulter, A., & Oldham, J. (2016). Person-centred care: what is it and how do we get there? *Future Hosp J*, *3*(2), 114-116. https://doi.org/10.7861/futurehosp.3-2-114

Coulter, I., Snider, P., & Neil, A. (2019). Vitalism–a worldview revisited: a critique of vitalism and its implications for integrative medicine. *Integrative Medicine: A Clinician's Journal*, *18*(3), 60.

Creswell, J., Clark, V., Gutmann, M., & Hanson, W. (2003). Advance Mixed methods Research Designs. In (pp. 209-240).

Creswell, J. D., & Creswell, J. W. (2022). *Research Design* (6 ed.). Sage Publications US.

Crowther, E. R. (2014). A comparison of quality and satisfaction experiences of patients attending chiropractic and physician offices in Ontario. *The Journal of the Canadian Chiropractic Association*, *58*(1), 24.

Dagenais, S., & Haldeman, S. (2012). Shared decision making through informed consent in chiropractic management of low back pain. *Journal of Manipulative and Physiological Therapeutics*, *35*(3), 216-226.

Danermark, B. (2019). Applied interdisciplinary research: a critical realist perspective. *Journal of Critical Realism*, *18*, 368-382. https://doi.org/10.1080/14767430.2019.1644983

de Souza, D. (2022). A critical realist approach to systems thinking in evaluation. *Evaluation*, *28*, 72-90. https://doi.org/10.1177/13563890211064639

de Souza, D. E. (2013). Elaborating the Context-Mechanism-Outcome configuration (CMOc) in realist evaluation: A critical realist perspective. *Evaluation*, *19*(2), 141-154. https://doi.org/10.1177/1356389013485194

Dhopte, P., French, S. D., Quon, J. A., Owens, H., & Bussières, A. (2019). Guideline implementation in the Canadian chiropractic setting: a pilot cluster randomized controlled trial and parallel study. *Chiropractic & manual therapies*, *27*(1), 1-13.

Diener, M. J., Hilsenroth, M. J., & Weinberger, J. (2009). A primer on meta-analysis of correlation coefficients: the relationship between patient-reported therapeutic alliance and adult attachment style as an illustration. *Psychother Res*, *19*(4-5), 519-526. https://doi.org/10.1080/10503300802491410

Diener, M. J., & Monroe, J. M. (2011). The relationship between adult attachment style and therapeutic alliance in individual psychotherapy: a meta-analytic review. *Psychotherapy (Chic)*, *48*(3), 237-248. https://doi.org/10.1037/a0022425

Dowling, N. M., Bolt, D. M., Deng, S., & Li, C. (2016). Measurement and control of bias in patient reported outcomes using multidimensional item response theory. *BMC medical research methodology*, *16*(1), 63. https://doi.org/10.1186/s12874-016-0161-z

Drossman, D. A., Chang, L., Deutsch, J. K., Ford, A. C., Halpert, A., Kroenke, K., Nurko, S., Ruddy, J., Snyder, J., & Sperber, A. (2021). A Review of the Evidence and Recommendations on Communication Skills and the Patient–Provider Relationship: A Rome Foundation Working Team Report. *Gastroenterology*, *161*(5), 1670-1688.e1677. https://doi.org/https://doi.org/10.1053/j.gastro.2021.07.037

Dumez, V., & Pomey, M.-P. (2019). From Medical Paternalism to Care Partnerships: A Logical Evolution Over Several Decades. In M.-P. Pomey, J.-L. Denis, & V. Dumez (Eds.), *Patient Engagement: How Patient-provider Partnerships Transform Healthcare Organizations* (pp. 9-16). Springer International Publishing. https://doi.org/10.1007/978-3-030-14101-1_2

Edwards, P. K., O'Mahoney, J., & Vincent, S. (2014). *Studying Organizations Using Critical Realism : a Practical Guide* (Online edition. ed.). Oxford University Press. https://doi.org/https://doi.org/10.1093/acprof:oso/9780199665525.001.0001

Elder-Vass, D. (2010). Agency. *Cambridge University Press eBooks*, 87-114. https://doi.org/10.1017/cbo9780511761720.005

Ellingsen, D. M., Leknes, S., Løseth, G., Wessberg, J., & Olausson, H. (2015). The Neurobiology Shaping Affective Touch: Expectation, Motivation, and Meaning in the Multisensory Context. *Front Psychol*, *6*, 1986. https://doi.org/10.3389/fpsyg.2015.01986

Elvins, R., & Green, J. (2008). The conceptualization and measurement of therapeutic alliance: An empirical review. *Clinical psychology review*, *28*(7), 1167-1187.

Elwyn, G., & Vermunt, N. (2020). Goal-Based Shared Decision-Making: Developing an Integrated Model. *J Patient Exp*, *7*(5), 688-696. https://doi.org/10.1177/2374373519878604

Emadi Andani, M., Tinazzi, M., Corsi, N., & Fiorio, M. (2015). Modulation of inhibitory corticospinal circuits induced by a nocebo procedure in motor performance. *PloS one*, *10*(4), e0125223. https://doi.org/10.1371/journal.pone.0125223

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *Am J Psychiatry*, *137*(5), 535-544. https://doi.org/10.1176/ajp.137.5.535

English, W., Gott, M., & Robinson, J. (2022). The meaning of rapport for patients, families, and healthcare professionals: A scoping review. *Patient Education and Counseling*, *105*(1), 2-14. https://doi.org/https://doi.org/10.1016/j.pec.2021.06.003

Esteves, J. E., Cerritelli, F., Kim, J., & Friston, K. J. (2022). Osteopathic Care as (En)active Inference: A Theoretical Framework for Developing an Integrative Hypothesis in Osteopathy. *Front Psychol*, *13*, 812926. https://doi.org/10.3389/fpsyg.2022.812926

Falkenström, F., Hatcher, R. L., & Holmqvist, R. (2015). Confirmatory Factor Analysis of the Patient Version of the Working Alliance Inventory--Short Form Revised. *Assessment*, *22*(5), 581-593. https://doi.org/10.1177/1073191114552472

Feldman, R. (2017). The Neurobiology of Human Attachments. *Trends in Cognitive Sciences*, *21*(2), 80-99. https://doi.org/10.1016/j.tics.2016.11.007

Fernández-Ballesteros, R., Sánchez-Izquierdo, M., Olmos, R., Huici, C., Ribera Casado, J. M., & Cruz Jentoft, A. (2019). Paternalism vs. Autonomy: Are They Alternative Types of Formal Care? *Front Psychol*, *10*, 1460. https://doi.org/10.3389/fpsyg.2019.01460

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

Field, J. R., & Newell, D. (2016). Clinical Outcomes in a Large Cohort of Musculoskeletal Patients Undergoing Chiropractic Care in the United Kingdom: A Comparison of Self- and National Health Service-Referred Routes. *J Manipulative Physiol Ther*, *39*(1), 54-62. https://doi.org/10.1016/j.jmpt.2015.12.003

Field, T. (2019). Social touch, CT touch and massage therapy: A narrative review. *Developmental Review*, *51*, 123-145. https://doi.org/https://doi.org/10.1016/j.dr.2019.01.002

Fikar, P. E., Edlund, K. A., & Newell, D. (2015). Current preventative and health promotional care offered to patients by chiropractors in the United Kingdom: a survey. *Chiropractic & manual therapies*, *23*(1), 1-7.

Fletcher, A. J. (2017). Applying critical realism in qualitative research: methodology meets method. *International Journal of Social Research Methodology*, *20*(2), 181-194. https://doi.org/10.1080/13645579.2016.1144401

Flückiger, C., Del Re, A. C., Wampold, B. E., & Horvath, A. O. (2018). The alliance in adult psychotherapy: A meta-analytic synthesis. *Psychotherapy*, *55*(4), 316.

Flückiger, C., Horvath, A. O., & Brandt, H. (2022). The evolution of patients' concept of the alliance and its relation to outcome: A dynamic latent-class structural equation modeling approach. *J Couns Psychol*, *69*(1), 51-62. https://doi.org/10.1037/cou0000555

Foley, H., Steel, A., & Adams, J. (2020). Perceptions of person-centred care amongst individuals with chronic conditions who consult complementary medicine practitioners. *Complementary therapies in medicine*, *52*, 102518.

Fonagy, P., Campbell, C., Constantinou, M., Higgitt, A., Allison, E., & Luyten, P. (2022). Culture and psychopathology: An attempt at reconsidering the role of social learning. *Development and Psychopathology*, *34*(4), 1205-1220.

Fonagy, P., Luyten, P., & Allison, E. (2015). Epistemic petrification and the restoration of epistemic trust: A new conceptualization of borderline personality disorder and its psychosocial treatment. *Journal of personality disorders*, *29*(5), 575-609.

Fonagy, P., Luyten, P., Allison, E., & Campbell, C. (2019). Mentalizing, epistemic trust and the phenomenology of psychotherapy. *Psychopathology*, *52*(2), 94-103.

Fowler, C. (n.d.). Fowler ProChiropractic and Wellness Center. http://www.drchrisfowler.com/treatment-and-testing/active-care-vs.-maintenance-care.html

Fraley, R., Heffernan, M., Vicary, A., & Brumbaugh, C. (2011). The Experiences in Close Relationships-Relationship Structures Questionnaire: A Method for Assessing Attachment Orientations Across Relationships. *Psychological assessment*, *23*, 615-625. https://doi.org/10.1037/a0022898

Fraley, R. C. (2014). *Relationship Structures (ECR-RS) Questionnaire*. Retrieved 27.04. from http://labs.psychology.illinois.edu/~rcfraley/measures/relstructures.htm

Fraley, R. C., Hudson, N. W., Heffernan, M. E., & Segal, N. (2015). Are adult attachment styles categorical or dimensional? A taxometric analysis of general and relationship-specific attachment orientations. *Journal of Personality and social Psychology*, *109*(2), 354-368. https://doi.org/10.1037/pspp0000027

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *J Pers Soc Psychol*, *78*(2), 350-365. https://doi.org/10.1037//0022-3514.78.2.350

Freud, S. (1912a). The dynamics of transference. *Classics in psychoanalytic techniques*, *12*, 97-108.

Freud, S. (1912b). *Recommendations to physicians practising psycho-analysis* (Vol. 12). Princeton, NJ.

Freud, S., Freud, A., Strachey, A., & Strachey, J. (1991). *On Beginning the Treatment:(Further Recommendations on the Technique of Psycho-analysis I)*. Hogarth Press and the Institute of psycho-analysis.

Friston, K. (2010). The free-energy principle: a unified brain theory? *Nature reviews neuroscience*, *11*(2), 127-138.

Fuentes, J., Armijo-Olivo, S., Funabashi, M., Miciak, M., Dick, B., Warren, S., Rashiq, S., Magee, D. J., & Gross, D. P. (2014). Enhanced therapeutic alliance modulates pain intensity and muscle pain sensitivity in patients with chronic low back pain: an experimental controlled study. *Phys Ther*, *94*(4), 477-489. https://doi.org/10.2522/ptj.20130118

Fuertes, J. N. (2019). *Working Alliance Skills for Mental Health Professionals*. Oxford University Press. https://doi.org/10.1093/med-psych/9780190868529.001.0001

Fuertes, J. N., Mislowack, A., Bennett, J., Paul, L., Gilbert, T. C., Fontan, G., & Boylan, L. S. (2007). The physician-patient working alliance. *Patient Educ Couns*, *66*(1), 29-36. https://doi.org/10.1016/j.pec.2006.09.013

Fuertes, J. N., Toporovsky, A., Reyes, M., & Osborne, J. B. (2017). The physician-patient working alliance: Theory, research, and future possibilities. *Patient Educ Couns*, *100*(4), 610-615. https://doi.org/10.1016/j.pec.2016.10.018

Gabbert, F., Hope, L., Luther, K., Wright, G., Ng, M., & Oxburgh, G. (2021). Exploring the use of rapport in professional information-gathering contexts by systematically mapping the evidence base. *Applied Cognitive Psychology*, *35*(2), 329-341. https://doi.org/https://doi.org/10.1002/acp.3762

Gatterman, M. I. (1995). A patient-centered paradigm: a model for chiropractic education and research. *The Journal of Alternative and Complementary Medicine*, *1*(4), 371-386.

Gaumer, G. (2006). Factors associated with patient satisfaction with chiropractic care: survey and review of the literature. *Journal of Manipulative and Physiological Therapeutics*, *29*(6), 455-462.

GCC. (1994). *Chiropractors Act 1994*. https://www.legislation.gov.uk/ukpga/1994/17/contents: https://www.legislation.gov.uk

The Code: Standards of conduct, performance and ethics for chiropractors, GCC (2016). https://www.gcc-uk.org/i-am-a-chiropractor/guidance/the-code

GCC. (2024a). *Becoming a Chiropractor*. General Chiropractic Counci. https://www.gcc-uk.org/education-and-registration

GCC. (2024b). *Studying to become a chiropractor*. General Chiropractic Council. https://www.gcc-uk.org/education-and-registration/studying-chiropractic

Gelso, C. J., & Carter, J. A. (1994). Components of the psychotherapy relationship: Their interaction and unfolding during treatment. *Journal of counseling psychology*, *41*(3), 296-306. https://doi.org/10.1037/0022-0167.41.3.296

Gelso, C. J., Kivlighan, D. M., & Markin, R. D. (2018). The real relationship and its role in psychotherapy outcome: A meta-analysis. *Psychotherapy (Chic)*, *55*(4), 434-444. https://doi.org/10.1037/pst0000183

Gelso, C. J., & Kline, K. V. (2019). The sister concepts of the working alliance and the real relationship: on their development, rupture, and repair. *Res Psychother*, *22*(2), 373. https://doi.org/10.4081/ripppo.2019.373

Gemmell, H. A., & Hayes, B. M. (2001). Patient satisfaction with chiropractic physicians in an independent physicians' association. *Journal of Manipulative and Physiological Therapeutics*, *24*(9), 556-559.

Gille, F., Smith, S., & Mays, N. (2017). Towards a broader conceptualisation of 'public trust' in the health care system. *Social Theory & Health*, *15*(1), 25-43. https://doi.org/10.1057/s41285-016-0017-y

Gíslason, H. F., Salminen, J. K., Sandhaugen, L., Storbråten, A. S., Versloot, R., Roug, I., & Newell, D. (2019). The shape of chiropractic in Europe: a cross sectional survey of chiropractor's beliefs and practice. *Chiropr Man Therap*, *27*, 16. https://doi.org/10.1186/s12998-019-0237-z

Glasgow, R. E., Wagner, E. H., Schaefer, J., Mahoney, L. D., Reid, R. J., & Greene, S. M. (2005). Development and validation of the patient assessment of chronic illness care (PACIC). *Medical care*, 436-444.

Gliedt, J. A., Battaglia, P. J., & Holmes, B. D. (2020). The prevalence of psychosocial related terminology in chiropractic program courses, chiropractic accreditation standards, and

chiropractic examining board testing content in the United States. *Chiropractic & manual therapies*, *28*(1), 43. https://doi.org/10.1186/s12998-020-00332-7

Gliedt, J. A., Spector, A. L., Schneider, M. J., Williams, J., & Young, S. (2023). Disparities in chiropractic utilization by race, ethnicity and socioeconomic status: A scoping review of the literature. *J Integr Med*, *21*(2), 159-167. https://doi.org/10.1016/j.joim.2023.02.002

Greenson, R. R. (1965). The working alliance and the transference neurosis. *The Psychoanalytic Quarterly*, *34*(2), 155-179.

Greenson, R. R. (1971). The "real" relationship between the patient and the psychoanalyst. *The unconscious today*, 213-232.

Haas, M., Vavrek, D., Neradilek, M. B., & Polissar, N. (2014). A path analysis of the effects of the doctor-patient encounter and expectancy in an open-label randomized trial of spinal manipulation for the care of low back pain. *BMC complementary and alternative medicine*, *14*(1), 1-11.

Hadamitzky, M., Sondermann, W., Benson, S., & Schedlowski, M. (2018). Placebo Effects in the Immune System. *Int Rev Neurobiol*, *138*, 39-59. https://doi.org/10.1016/bs.irn.2018.01.001

Hall, A. M., Ferreira, P. H., Maher, C. G., Latimer, J., & Ferreira, M. L. (2010). The influence of the therapist-patient relationship on treatment outcome in physical rehabilitation: a systematic review. *Physical therapy*, *90*(8), 1099-1110.

Hatcher, R. L., & Gillaspy, J. A. (2006). Development and validation of a revised short version of the Working Alliance Inventory. *Psychotherapy research*, *16*(1), 12-25.

Hauke, G., & Lohr, C. (2022). Piloting the Update: The Use of Therapeutic Relationship for Change–A Free Energy Account. *Frontiers in Psychology*, *13*, 842488.

Hauser, H. J. S. (2023). More than my experience: an argument for critical realism in person-centred psychotherapy. *Person-Centered & Experiential Psychotherapies*, 1-18. https://doi.org/10.1080/14779757.2023.2295528

Hayes, A. M., & Andrews, L. A. (2020). A complex systems approach to the study of change in psychotherapy. *BMC Medicine*, *18*(1), 197. https://doi.org/10.1186/s12916-020-01662-2

Hayes, J. A., Gelso, C. J., Goldberg, S., & Kivlighan, D. M. (2018). Countertransference management and effective psychotherapy: Meta-analytic findings. *Psychotherapy (Chic)*, *55*(4), 496-507. https://doi.org/10.1037/pst0000189

Health, R. *36-Item Short Form Survey (SF-36)*.

Hertzman-Miller, R. P., Morgenstern, H., Hurwitz, E. L., Yu, F., Adams, A. H., Harber, P., & Kominski, G. F. (2002). Comparing the satisfaction of low back pain patients randomized to receive medical or chiropractic care: results from the UCLA low-back pain study. *American Journal of Public Health*, *92*(10), 1628-1633.

Heyvaert, M., Hannes, K., Maes, B., & Onghena, P. (2013). Critical appraisal of mixed methods studies. *Journal of Mixed Methods Research*, *7*(4), 302-327.

Hiller, A., Guillemin, M., & Delany, C. (2015). Exploring healthcare communication models in private physiotherapy practice. *Patient Education and Counseling*, *98*(10), 1222-1228. https://doi.org/https://doi.org/10.1016/j.pec.2015.07.029

Hirschberg, J., Beňuš, Š., Gravano, A., & Levitan, R. (2020). Prosody in Discourse and Speaker State. In C. Gussenhhoven & A. Chen (Eds.), *The Oxford Handbook of Language Prosody* (pp. 468). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198832232.013.31

Hirschmann, K., & Schlair, S. (2020). Relationship-Centered Care. In P. V. Sreeramoju, S. G. Weber, A. A. Snyder, L. M. Kirk, W. G. Reed, & B. A. Hardy-Decuir (Eds.), *The Patient and Health Care System: Perspectives on High-Quality Care* (pp. 173-184). Springer International Publishing. https://doi.org/10.1007/978-3-030-46567-4_14

Holmes, M. B., Scott, A., Camarinos, J., Marinko, L., & George, S. Z. (2023). Working Alliance Inventory (WAI) and its relationship to patient-reported outcomes in painful musculoskeletal conditions. *Disability and Rehabilitation*, *45*(8), 1363-1369. https://doi.org/10.1080/09638288.2022.2060337

Hong, Q. N., Pluye, P., Bujold, M., & Wassef, M. (2017). Convergent and sequential synthesis designs: implications for conducting and reporting systematic reviews of qualitative and quantitative evidence. *Systematic Reviews*, *6*, 1-14.

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., & Nicolau, B. (2019). Improving the content validity of the mixed methods appraisal tool: a modified e-Delphi study. *Journal of clinical epidemiology*, *111*, 49-59. e41.

Horton, A., Hebson, G., & Holman, D. (2021). A longitudinal study of the turning points and trajectories of therapeutic relationship development in occupational and physical therapy. *BMC health services research*, *21*(1), 1-14.

Horvath, A. O., & Greenberg, L. S. (1986). The development of the Working Alliance Inventory. In *The psychotherapeutic process: A research handbook.* (pp. 529-556). Guilford Press.

Horvath, A. O., & Greenberg, L. S. (1989). Development and validation of the Working Alliance Inventory. *Journal of counseling psychology*, *36*(2), 223.

Horvath, A. O., & Luborsky, L. (1993). The role of the therapeutic alliance in psychotherapy. *Journal of consulting and clinical psychology*, *61*(4), 561.

Hunter, J. J., & Maunder, R. G. (2001). Using attachment theory to understand illness behavior. *Gen Hosp Psychiatry*, *23*(4), 177-182. https://doi.org/10.1016/s0163-8343(01)00141-4

Hurwitz, E. L., Morgenstern, H., & Yu, F. (2005). Satisfaction as a predictor of clinical outcomes among chiropractic and medical patients enrolled in the UCLA low back pain study. *Spine*, *30*(19), 2121-2128.

Hutting, N., Caneiro, J. P., Ong'wen, O. M., Miciak, M., & Roberts, L. (2022). Patient-centered care in musculoskeletal practice: Key elements to support clinicians to focus on the person. *Musculoskeletal Science and Practice*, *57*, 102434. https://doi.org/https://doi.org/10.1016/j.msksp.2021.102434

Iben, A., Elisabeth Björk, B., Anders Galaasen, B., & Lydia, K. (2021). Recruiting in intervention studies: challenges and solutions. *BMJ open*, *11*(1), e044702. https://doi.org/10.1136/bmjopen-2020-044702

Iben, A., Lise, H., & Charlotte, L. Y. (2019). Chiropractic maintenance care - what's new? A systematic review of the literature. *Chiropr Man Therap*, *27*, 63. https://doi.org/10.1186/s12998-019-0283-6

Ingram, S., Stenner, R., & May, S. (2023). The experiences of uncertainty amongst musculoskeletal physiotherapists in first contact practitioner roles within primary care. *Musculoskeletal Care*, *21*(3), 644-654. https://doi.org/10.1002/msc.1735

Innes, S. I., Leboeuf-Yde, C., & Walker, B. F. (2019). Attempting to explore chiropractors and their clinical choices: an examination of a failed study. *Chiropractic & manual therapies*, *27*(1), 1-9.

Ivanova, D., Bishop, F., Newell, D., & Field, J. (2021). Mixed methods systematic review of the literature base exploring working alliance in the chiropractic profession. In *Prospero* (Vol. CRD42021238091, pp. Protocol registration). https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=238091.

Ivanova, D., Bishop, F., Newell, D., Field, J., & Walsh, M. (2022). Mixed methods systematic review of the literature base exploring working alliance in the chiropractic profession. *Chiropr Man Therap*, *30*(1), 35. https://doi.org/10.1186/s12998-022-00442-4

Ivanova, D., Newell, D., Field, J., & Bishop, F. L. (2024). The development of working alliance in early stages of care from the perspective of patients attending a chiropractic teaching clinic. *Chiropractic & manual therapies*, *32*(1), 10. https://doi.org/10.1186/s12998-023-00527-8

Jamison, J. (1996). The chiropractic consultation: establishing a therapeutic alliance. *CHIROPRACTIC JOURNAL OF AUSTRALIA*, *26*, 94-99.

Jamison, J. R. (2000). Patient-practitioner perceptions: can chiropractors assume congruence? *Journal of Manipulative and Physiological Therapeutics*, *23*(6), 409-413.

Janse, R. J., Hoekstra, T., Jager, K. J., Zoccali, C., Tripepi, G., Dekker, F. W., & van Diepen, M. (2021). Conducting correlation analysis: important limitations and pitfalls. *Clin Kidney J*, *14*(11), 2332-2337. https://doi.org/10.1093/ckj/sfab085

Jenkins, H. J., Downie, A., Wong, J. J., Young, J. J., Roseen, E. J., Nim, C. G., McNaughton, D., Øveras, C. K., Hartvigsen, J., Mior, S., & French, S. D. (2023). Patient and provider characteristics associated with therapeutic intervention selection in a chiropractic clinical encounter: a cross-sectional analysis of the COAST and O-COAST study data. *Chiropractic & manual therapies*, *31*(1), 39. https://doi.org/10.1186/s12998-023-00515-y

Jones, G. R., & George, J. M. (1998). The experience and evolution of trust: Implications for cooperation and teamwork. *The Academy of Management Review*, *23*(3), 531-546. https://doi.org/10.2307/259293

Kaba, R., & Sooriakumaran, P. (2007). The evolution of the doctor-patient relationship. *International Journal of Surgery*, *5*(1), 57-65. https://doi.org/https://doi.org/10.1016/j.ijsu.2006.01.005

Kee, J. W. Y., Khoo, H. S., Lim, I., & Koh, M. Y. H. (2018). Communication Skills in Patient-Doctor Interactions: Learning from Patient Complaints. *Health Professions Education*, *4*(2), 97-106. https://doi.org/https://doi.org/10.1016/j.hpe.2017.03.006

Kelley, J. M., Kraft-Todd, G., Schapira, L., Kossowsky, J., & Riess, H. (2014). The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PloS one*, *9*(4), e94207.

Kelly, E. P., Tsilimigras, D. I., Hyer, J. M., & Pawlik, T. M. (2019). Understanding the use of attachment theory applied to the patient-provider relationship in cancer care: Recommendations for future research and clinical practice. *Surgical Oncology*, *31*, 101-110. https://doi.org/10.1016/j.suronc.2019.10.007

King, A., & Hoppe, R. B. (2013). "Best practice" for patient-centered communication: a narrative review. *J Grad Med Educ*, *5*(3), 385-393. https://doi.org/10.4300/jgme-d-13-00072.1

King, N., & Brooks, J. M. (2016). *Template analysis for business and management students*. Sage.

Kinney, M., Seider, J., Beaty, A. F., Coughlin, K., Dyal, M., & Clewley, D. (2020). The impact of therapeutic alliance in physical therapy for chronic musculoskeletal pain: A systematic review of the literature. *Physiother Theory Pract*, *36*(8), 886-898. https://doi.org/10.1080/09593985.2018.1516015

Kleiner, M. J., Kinsella, E. A., Miciak, M., Teachman, G., McCabe, E., & Walton, D. M. (2023). An integrative review of the qualities of a 'good'physiotherapist. *Physiotherapy theory and practice*, *39*(1), 89-116.

Koopmans, E., & Schiller, D. C. (2022). Understanding Causation in Healthcare: An Introduction to Critical Realism. *Qual Health Res*, *32*(8-9), 1207-1214. https://doi.org/10.1177/10497323221105737

Kramer, U., de Roten, Y., Beretta, V., Michel, L., & Despland, J. N. (2009). Alliance patterns over the course of short-term dynamic psychotherapy: the shape of productive relationships. *Psychother Res*, *19*(6), 699-706. https://doi.org/10.1080/10503300902956742

Krupnik, V. (2023). The Therapeutic Alliance as Active Inference: The Role of Trust and Self-Efficacy. *Journal of Contemporary Psychotherapy*, *53*(3), 207-215. https://doi.org/10.1007/s10879-022-09576-1

Lakke, S. E., & Meerman, S. (2016). Does working alliance have an influence on pain and physical functioning in patients with chronic musculoskeletal pain; a systematic review. *Journal of compassionate health care*, *3*(1), 1-10.

Lambers, N. M., & Bolton, J. E. (2016). Perceptions of the quality of the therapeutic alliance in chiropractic care in the Netherlands: a cross-sectional survey. *Chiropractic & manual therapies*, *24*(1), 1-11.

Langberg, E. M., Dyhr, L., & Davidsen, A. S. (2019). Development of the concept of patient-centredness – A systematic review. *Patient Education and Counseling*, *102*(7), 1228-1236. https://doi.org/https://doi.org/10.1016/j.pec.2019.02.023

Lawton, M., Haddock, G., Conroy, P., & Sage, K. (2016). Therapeutic Alliances in Stroke Rehabilitation: A Meta-Ethnography. *Archives of Physical Medicine and Rehabilitation*, *97*(11), 1979-1993. https://doi.org/https://doi.org/10.1016/j.apmr.2016.03.031

Lewicki, R. J., McAllister, D. J., & Bies, R. J. (1998). Trust and distrust: New relationships and realities. *The Academy of Management Review*, *23*(3), 438-458. https://doi.org/10.2307/259288

Li, E., Campbell, C., Midgley, N., & Luyten, P. (2023). Epistemic trust: a comprehensive review of empirical insights and implications for developmental psychopathology. *Res Psychother*, *26*(3). https://doi.org/10.4081/ripppo.2023.704

Lizarondo, L., Stern, C., Carrier, J., Godfrey, C., Rieger, K., Salmond, S., Apostolo, J., Kirkpatrick, P., & Loveday, H. (2020). Mixed methods systematic reviews. In L. C. Aromataris E, Porritt K, Pilla B, Jordan Z (Ed.), *BI Manual for Evidence Synthesis*. JBI. https://doi.org/https://doi.org/10.46658/JBIMES-24-07

Magill, M., Martino, S., & Wampold, B. E. (2024). Defining the therapeutic relationship in the context of alcohol use, other drug use, and behavior change: Principles and practices. *Journal of Substance Use and Addiction Treatment*, *163*, 209398. https://doi.org/https://doi.org/10.1016/j.josat.2024.209398

Maharaj, A. S., Bhatt, N. V., & Gentile, J. P. (2021). Bringing It in the Room: Addressing the Impact of Racism on the Therapeutic Alliance. *Innov Clin Neurosci*, *18*(7-9), 39-43.

Maiers, M., & Salsbury, S. A. (2021). "Like Peanut Butter and Jelly": A Qualitative Study of Chiropractic Care and Home Exercise Among Older Adults with Spinal Disability. *Arthritis Care & Research*.

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample Size in Qualitative Interview Studies: Guided by Information Power. *Qual Health Res*, *26*(13), 1753-1760. https://doi.org/10.1177/1049732315617444

Maratos, F. A., Duarte, J., Barnes, C., McEwan, K., Sheffield, D., & Gilbert, P. (2017). The physiological and emotional effects of touch: Assessing a hand-massage intervention with high self-critics. *Psychiatry Res*, *250*, 221-227. https://doi.org/10.1016/j.psychres.2017.01.066

Marchiori, D. M., Henkin, A. B., & Hawk, C. (2008). Social communication skills of chiropractors: implications for professional practice. *Journal of Manipulative and Physiological Therapeutics*, *31*(9), 682-689.

Mata, Á. N. d. S., de Azevedo, K. P. M., Braga, L. P., de Medeiros, G. C. B. S., de Oliveira Segundo, V. H., Bezerra, I. N. M., Pimenta, I. D. S. F., Nicolás, I. M., & Piuvezam, G. (2021). Training in communication skills for self-efficacy of health professionals: a systematic review. *Human Resources for Health*, *19*(1), 30. https://doi.org/10.1186/s12960-021-00574-3

Maunder, & Hunter. (2016). Can patients be 'attached' to healthcare providers? An observational study to measure attachment phenomena in patient–provider relationships. *BMJ open*, *6*(5), e011068. https://doi.org/10.1136/bmjopen-2016-011068

McKenzie, J. E., & Brennan, S. E. (2019). Synthesizing and presenting findings using other methods. *Cochrane Handbook for systematic reviews of interventions*, 321-347.

McLaughlin, A. A., Keller, S. M., Feeny, N. C., Youngstrom, E. A., & Zoellner, L. A. (2014). Patterns of therapeutic alliance: rupture-repair episodes in prolonged exposure for posttraumatic stress disorder. *Journal of consulting and clinical psychology*, *82*(1), 112-121. https://doi.org/10.1037/a0034696

McParlin, Z., Cerritelli, F., Friston, K. J., & Esteves, J. E. (2022). Therapeutic Alliance as Active Inference: The Role of Therapeutic Touch and Synchrony. *Front Psychol*, *13*, 783694. https://doi.org/10.3389/fpsyg.2022.783694

McParlin, Z., Cerritelli, F., Manzotti, A., Friston, K. J., & Esteves, J. E. (2023). Therapeutic touch and therapeutic alliance in pediatric care and neonatology: An active inference framework. *Front Pediatr*, *11*, 961075. https://doi.org/10.3389/fped.2023.961075

Mead, N., & Bower, P. (2000). Patient-centredness: a conceptual framework and review of the empirical literature. *Social Science & Medicine*, *51*(7), 1087-1110. https://doi.org/https://doi.org/10.1016/S0277-9536(00)00098-8

Microsoft Teams software In. (2022). (Version 1.5.00.28361) Microsoft.

Mikulincer, M. (1998). Attachment working models and the sense of trust: An exploration of interaction goals and affect regulation. *Journal of Personality and social Psychology*, *74*(5), 1209-1224. https://doi.org/10.1037/0022-3514.74.5.1209

Mikulincer, M., & Shaver, P. R. (2010). *Attachment in adulthood: Structure, dynamics, and change*. Guilford Publications.

Mikulincer, M., & Shaver, P. R. (2019). Attachment orientations and emotion regulation. *Curr Opin Psychol*, *25*, 6-10. https://doi.org/10.1016/j.copsyc.2018.02.006

Mills, J.-A., Marks, E., Reynolds, T., & Cieza, A. (2017). Rehabilitation: essential along the continuum of care. *Disease Control Priorities: Improving Health and Reducing Poverty. 3rd edition*.

Mior, S. A. (2010). *Patients' Perceptions of the Primary Care Characteristics in a Model of Interprofessional Patient-centred Collaboration between Chiropractors and Physicians*

Moecke, D. P., & Camp, P. G. (2024). Social support from the physiotherapist and the therapeutic relationship in physiotherapy: bridging theory to practice. *Physiotherapy theory and practice*, 1-11. https://doi.org/10.1080/09593985.2024.2372687

Moore, A. J., Holden, M. A., Foster, N. E., & Jinks, C. (2020). Therapeutic alliance facilitates adherence to physiotherapy-led exercise and physical activity for older adults with knee pain: a longitudinal qualitative study. *Journal of physiotherapy*, *66*(1), 45-53.

Moore, C. L., & Kaplan, S. L. (2018). A Framework and Resources for Shared Decision Making: Opportunities for Improved Physical Therapy Outcomes. *Phys Ther*, *98*(12), 1022-1036. https://doi.org/10.1093/ptj/pzy095

Moore, J. S. (1995). Chiropractic: History and Evolution of a New Profession. By Walter I. Wardwell. (St. Louis: Mosby, 1992. xvi, 358 pp. $42.95, ISBN 0-8016-6883-2.). *Journal of American History*, *82*(1), 287-288. https://doi.org/10.2307/2082065

Morrison, T. L., & Smith, J. D. (2013). Working alliance development in occupational therapy: A cross-case analysis. *Australian Occupational Therapy Journal*, *60*(5), 326-333.

Mortari, L. (2015). Reflectivity in Research Practice:An Overview of Different Perspectives. *International Journal of Qualitative Methods*, *14*(5), 1609406915618045. https://doi.org/10.1177/1609406915618045

Mukumbang, F. C. (2023). Retroductive Theorizing: A Contribution of Critical Realism to Mixed Methods Research. *Journal of Mixed Methods Research*, *17*(1), 93-114. https://doi.org/10.1177/15586898211049847

Mukumbang, F. C., Kabongo, E. M., & Eastwood, J. G. (2021). Examining the Application of Retroductive Theorizing in Realist-Informed Studies. *International Journal of Qualitative Methods*, *20*, 16094069211053516. https://doi.org/10.1177/16094069211053516

Mukumbang, F. C., & van Wyk, B. (2020). Leveraging the Photovoice Methodology for Critical Realist Theorizing. *International Journal of Qualitative Methods*, *19*, 1609406920958981. https://doi.org/10.1177/1609406920958981

Mulder, R., Murray, G., & Rucklidge, J. (2017). Common versus specific factors in psychotherapy: opening the black box. *The lancet. Psychiatry*, *4*(12), 953-962. https://doi.org/10.1016/S2215-0366(17)30100-1

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC medical research methodology*, *18*(1), 143. https://doi.org/10.1186/s12874-018-0611-x

Muran, J. C., & Barber, J. P. (2010). *The therapeutic alliance: An evidence-based guide to practice*. The Guilford Press.

Muran, J. C., & Barber, J. P. (2011). *The therapeutic alliance: An evidence-based guide to practice*. Guilford Press.

Murphy, J. I., Weaver, N. E., & Hendricks, A. E. (2022). Accessible analysis of longitudinal data with linear mixed effects models. *Dis Model Mech*, *15*(5). https://doi.org/10.1242/dmm.048025

Myers, C., Thompson, G., Hughey, L., Young, J. L., Rhon, D. I., & Rentmeester, C. (2022). An exploration of clinical variables that enhance therapeutic alliance in patients seeking care for musculoskeletal pain: A mixed methods approach. *Musculoskeletal Care*, *20*(3), 577-592. https://doi.org/10.1002/msc.1615

Newell, D., Lothe, L. R., & Raven, T. J. L. (2017). Contextually Aided Recovery (CARe): a scientific theory for innate healing. *Chiropr Man Therap*, *25*(1), 6. https://doi.org/10.1186/s12998-017-0137-z

Newhill, C. E., Safran, J. D., & Muran, J. C. (2003). *Negotiating the therapeutic alliance: A relational treatment guide*. Guilford Press.

Newman, D. A. (2014). Missing Data:Five Practical Guidelines. *Organizational Research Methods*, *17*(4), 372-411. https://doi.org/10.1177/1094428114548590

Nicholson, D. J. (2010). *Organism and mechanism: A critique of mechanistic thinking in biology*. University of Exeter (United Kingdom).

Noakes, T. D. (2011). Time to move beyond a brainless exercise physiology: the evidence for complex regulation of human exercise performance. *Appl Physiol Nutr Metab*, *36*(1), 23-35. https://doi.org/10.1139/h10-082

Nundy, S., & Oswald, J. (2014). Relationship-centered care: A new paradigm for population health management. *Healthcare*, *2*(4), 216-219. https://doi.org/https://doi.org/10.1016/j.hjdsi.2014.09.003

NVivo. In. (2018). (Version 12) QSR International Pty Ltd.

O'Keeffe, M., Cullinane, P., Hurley, J., Leahy, I., Bunzli, S., O'Sullivan, P. B., & O'Sullivan, K. (2016). What Influences Patient-Therapist Interactions in Musculoskeletal Physical Therapy? Qualitative Systematic Review and Meta-Synthesis. *Phys Ther*, *96*(5), 609-622. https://doi.org/10.2522/ptj.20150240

Orlowski, E. W., Moeyaert, M., Monley, C., & Redden, C. (2024). The effects of cultural humility on therapeutic alliance and psychotherapy outcomes: A systematic review and meta-analysis. *Counselling and Psychotherapy Research*, *n/a*(n/a). https://doi.org/https://doi.org/10.1002/capr.12835

Oths, K. (1994). Communication in a chiropractic clinic: how a DC treats his patients. *Culture, medicine and psychiatry*, *18*(1), 83-113.

Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan—a web and mobile app for systematic reviews. *Systematic Reviews*, *5*(1), 210. https://doi.org/10.1186/s13643-016-0384-4

Paap, D., Karel, Y., Verhagen, A. P., Dijkstra, P. U., Geertzen, J. H. B., & Pool, G. (2022). The Working Alliance Inventory's Measurement Properties: A Systematic Review. *Front Psychol*, *13*, 945294. https://doi.org/10.3389/fpsyg.2022.945294

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., . . . Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, *372*, n71. https://doi.org/10.1136/bmj.n71

Palmer, B. (1958). Palmer's law of life (Vol. 36). *Davenport, IA: Palmer College*.

Parkinson, B., Meacock, R., Sutton, M., Fichera, E., Mills, N., Shorter, G. W., Treweek, S., Harman, N. L., Brown, R. C. H., Gillies, K., & Bower, P. (2019). Designing and using incentives to support recruitment and retention in clinical trials: a scoping review and a checklist for design. *Trials*, *20*(1), 624. https://doi.org/10.1186/s13063-019-3710-z

Parr, T., & Friston, K. J. (2019). Generalised free energy and active inference. *Biological Cybernetics*, *113*(5), 495-513. https://doi.org/10.1007/s00422-019-00805-w

Petrovic, P., Kalso, E., Petersson, K. M., & Ingvar, M. (2002). Placebo and opioid analgesia--imaging a shared neuronal network. *Science*, *295*(5560), 1737-1740. https://doi.org/10.1126/science.1067176

Pfeifer, A.-C., Penedo, J. M. G., Ehrenthal, J. C., Neubauer, E., Amelung, D., Schroeter, C., & Schiltenwolf, M. (2018). Impact of attachment behavior on the treatment process of chronic pain patients. *Journal of Pain Research*, *11*, 2653-2662. https://doi.org/10.2147/JPR.S165487

Pincus, T., Foster, N. E., Vogel, S., Santos, R., Breen, A., & Underwood, M. (2007). Attitudes to back pain amongst musculoskeletal practitioners: a comparison of professional groups and practice settings using the ABS-mp. *Manual therapy*, *12*(2), 167-175.

Pincus, T., Holt, N., Vogel, S., Underwood, M., Savage, R., Walsh, D. A., & Taylor, S. J. C. (2013). Cognitive and affective reassurance and patient outcomes in primary care: a systematic review. *Pain*, *154*(11), 2407-2416. https://doi.org/10.1016/j.pain.2013.07.019

Pinto, R. Z., Ferreira, M. L., Oliveira, V. C., Franco, M. R., Adams, R., Maher, C. G., & Ferreira, P. H. (2012). Patient-centred communication is associated with positive therapeutic alliance: a systematic review. *Journal of physiotherapy*, *58*(2), 77-87. https://doi.org/https://doi.org/10.1016/S1836-9553(12)70087-5

Piper, W. E., Ogrodniczuk, J. S., Lamarche, C., Hilscher, T., & Joyce, A. S. (2005). Level of alliance, pattern of alliance, and outcome in short-term group therapy. *Int J Group Psychother*, *55*(4), 527-550. https://doi.org/10.1521/ijgp.2005.55.4.527

Pluye, P., & Hong, Q. N. (2014). Combining the power of stories and the power of numbers: mixed methods research and mixed studies reviews. *Annual review of public health*, *35*, 29-45.

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., & Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews. *A product from the ESRC methods programme Version*, *1*, b92.

Prashanti, E., Roland Brian, B., Kiran Kumar, K. S., Sally, H., John, M., & Mona, N. (2022). Developing an integrated multilevel model of uncertainty in health care: a qualitative systematic review and thematic synthesis. *BMJ Global Health*, *7*(5), e008113. https://doi.org/10.1136/bmjgh-2021-008113

Prinsen, C. A. C., Mokkink, L. B., Bouter, L. M., Alonso, J., Patrick, D. L., de Vet, H. C. W., & Terwee, C. B. (2018). COSMIN guideline for systematic reviews of patient-reported outcome measures. *Qual Life Res*, *27*(5), 1147-1157. https://doi.org/10.1007/s11136-018-1798-3

Qualtrics. (2022). *Qualtrics*. In (Version 04.2022) Qualtrics. https://www.qualtrics.com

Rake, E. A., Box, I. C. H., Dreesens, D., Meinders, M. J., Kremer, J. A. M., Aarts, J. W. M., & Elwyn, G. (2022). Bringing personal perspective elicitation to the heart of shared decision-making: A scoping review. *Patient Education and Counseling*, *105*(9), 2860-2870. https://doi.org/https://doi.org/10.1016/j.pec.2022.05.009

Rempel, J. K., Holmes, J. G., & Zanna, M. P. (1985). *Trust in close relationships* [doi:10.1037/0022-3514.49.1.95]. American Psychological Association.

Riggio, R. E. (1986). Assessment of basic social skills. *Journal of Personality and social Psychology*, *51*(3), 649.

Riggio, R. E. (2005). The Social Skills Inventory (SSI): measuring nonverbal and social skills. *The sourcebook of nonverbal measures: Going beyond words*, 25-33.

Riggio, R. E., Riggio, H. R., Salinas, C., & Cole, E. J. (2003). The role of social and emotional communication skills in leader emergence and effectiveness. *Group Dynamics: Theory, Research, and Practice*, *7*(2), 83.

Rocha, G., Peixoto, E., Primi, T., Motta, I., & Wiethaeuper, D. (2017). The Experiences in Close Relationships - Relationship Structures Questionnaire (ECR-RS): validity evidence and reliability. *Psico-USF*, *22*, 121-132. https://doi.org/10.1590/1413-82712017220111

Rogers, C. R. (1951). *Client-centered therapy*. Houghton Mifflin.

Rogers, C. R. (1965). The therapeutic relationship: Recent theory and research. *Australian Journal of Psychology*, *17*(2), 95-108.

Rohrer, J. M. (2018). Thinking Clearly About Correlations and Causation: Graphical Causal Models for Observational Data. *Advances in Methods and Practices in Psychological Science*, *1*(1), 27-42. https://doi.org/10.1177/2515245917745629

Roland, M., & Morris, R. (1983a). A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain. *Spine (Phila Pa 1976)*, *8*(2), 141-144. https://doi.org/10.1097/00007632-198303000-00004

Roland, M., & Morris, R. (1983b). A study of the natural history of low-back pain. Part II: development of guidelines for trials of treatment in primary care. *Spine (Phila Pa 1976)*, *8*(2), 145-150. https://doi.org/10.1097/00007632-198303000-00005

Roper, J., & Shapira, J. (2000). *Ethnography in Nursing Research* https://doi.org/10.4135/9781483328294

Rørtveit, K., Hansen, B. S., Leiknes, I., Joa, I., Testad, I., & Severinsson, E. (2015). Patients' experiences of trust in the patient-nurse relationship-a systematic review of qualitative studies.

Rossettini, G., Camerone, E. M., Carlino, E., Benedetti, F., & Testa, M. (2020). Context matters: the psychoneurobiological determinants of placebo, nocebo and context-related effects in physiotherapy. *Archives of Physiotherapy*, *10*(1), 1-12.

Rowe, R., & Calnan, M. (2006). Trust relations in health care: developing a theoretical framework for the "new" NHS. *J Health Organ Manag*, *20*(5), 376-396. https://doi.org/10.1108/14777260610701777

Russell, M. L., Verhoef, M. J., Injeyan, H. S., & McMorland, D. G. (2004). Response rates for surveys of chiropractors. *Journal of Manipulative and Physiological Therapeutics*, *27*(1), 43-48. https://doi.org/https://doi.org/10.1016/j.jmpt.2003.11.005

Sadr, S., Pourkiani-Allah-Abad, N., & Stuber, K. J. (2012). The treatment experience of patients with low back pain during pregnancy and their chiropractors: a qualitative study. *Chiropractic & manual therapies*, *20*(1), 1-8.

Safran, D. G., Kosinski, M., Tarlov, A. R., Rogers, W. H., Taira, D. H., Lieberman, N., & Ware, J. E. (1998). The Primary Care Assessment Survey: tests of data quality and measurement performance. *Med Care*, *36*(5), 728-739. https://doi.org/10.1097/00005650-199805000-00012

Safran, J. D. (2004). The Resolution of Ruptures in the Therapeutic Alliance. In *Journal of consulting and clinical psychology* (Vol. 64).

Safran, J. D., & Kraus, J. (2014). Alliance ruptures, impasses, and enactments: A relational perspective. *Psychotherapy*, *51*, 381-387. https://doi.org/10.1037/a0036815

Safran, J. D., & Muran, J. C. (1996). The resolution of ruptures in the therapeutic alliance. *J Consult Clin Psychol*, *64*(3), 447-458. https://doi.org/10.1037//0022-006x.64.3.447

Safran, J. D., & Muran, J. C. (2006). Has the concept of the therapeutic alliance outlived its usefulness? *Psychotherapy: Theory, Research, Practice, Training*, *43*(3), 286-291. https://doi.org/10.1037/0033-3204.43.3.286

Salsbury, S. A., Vining, R. D., Gosselin, D., & Goertz, C. M. (2018). Be good, communicate, and collaborate: a qualitative analysis of stakeholder perspectives on adding a chiropractor to the multidisciplinary rehabilitation team. *Chiropractic & manual therapies*, *26*(1), 1-13.

Sandelowski, M., Voils, C. I., & Barroso, J. (2006). Defining and designing mixed research synthesis studies. *Research in the schools: a nationally refereed journal sponsored by*

the Mid-South Educational Research Association and the University of Alabama, *13*(1), 29.

Santaguida, E., & Bergamasco, M. (2023). Attachment Theory in an Active Inference Framework: How Does Our Inner Model Take Shape? In C. L. Buckley, D. Cialfi, P. Lanillos, M. Ramstead, N. Sajid, H. Shimazaki, & T. Verbelen, *Active Inference* Cham.

Santi, D., Spaggiari, G., Romeo, M., Ebert, R., Corradini, F., Baraldi, C., Granata, A. R. M., Rochira, V., Simoni, M., Gavioli, L., & Niemants, N. S. A. (2022). Qualitative and quantitative analysis of doctor-patient interactions during andrological consultations. *Andrology*, *10*(7), 1240-1249. https://doi.org/10.1111/andr.13225

Sawyer, C., & Kassak, K. (1993). Patient satisfaction with chiropractic care. *Journal of Manipulative and Physiological Therapeutics*, *16*(1), 25-32.

Sayer, A. (2000). Realism and Social Science. In. SAGE Publications Ltd. https://doi.org/10.4135/9781446218730

Sharp, Lorenc, Morris, Feder, Little, Hollinghurst, Mercer, & MacPherson. (2018). Complementary medicine use, views, and experiences: a national survey in England. *BJGP Open*, *2*(4), bjgpopen18X101614. https://doi.org/10.3399/bjgpopen18X101614

Sherriff, B., Clark, C., Killingback, C., & Newell, D. (2023). Musculoskeletal practitioners' perceptions of contextual factors that may influence chronic low back pain outcomes: a modified Delphi study. *Chiropractic & manual therapies*, *31*. https://doi.org/10.1186/s12998-023-00482-4

Sigrell, H. (2002). Expectations of chiropractic treatment: what are the expectations of new patients consulting a chiropractor, and do chiropractors and patients have similar expectations? *Journal of Manipulative and Physiological Therapeutics*, *25*(5), 300-305.

Simpkin, A. L., & Armstrong, K. A. (2019). Communicating Uncertainty: a Narrative Review and Framework for Future Research. *J Gen Intern Med*, *34*(11), 2586-2591. https://doi.org/10.1007/s11606-019-04860-8

Simpson, J. K., & Young, K. J. (2020). Vitalism in contemporary chiropractic: a help or a hinderance? *Chiropractic & manual therapies*, *28*, 1-20.

Sims, W. D. (2009). *Relationship of General Adult Attachment and Physician-patient Attachment with Experience and Expression of Anger Among Chronic Pain Patients* Oklahoma State University].

Smith, R. C. (2002). The Biopsychosocial Revolution. *Journal of General Internal Medicine*, *17*(4), 309-310. https://doi.org/https://doi.org/10.1046/j.1525-1497.2002.20210.x

Smith, R. C., & Hoppe, R. B. (1991). The patient's story: integrating the patient-and physician-centered approaches to interviewing. *Annals of internal medicine*, *115*(6), 470-477.

Søndenå, P., Dalusio-King, G., & Hebron, C. (2020). Conceptualisation of the therapeutic alliance in physiotherapy: is it adequate? *Musculoskelet Sci Pract*, *46*, 102131. https://doi.org/10.1016/j.msksp.2020.102131

Spencer, L., Radcliffe, L., Spence, R., & King, N. (2021). Thematic trajectory analysis: A temporal method for analysing dynamic qualitative data. *Journal of Occupational and Organizational Psychology*, *94*(3), 531-567. https://doi.org/https://doi.org/10.1111/joop.12359

Sperber, D., Clément, F., Heintz, C., Mascaro, O., Mercier, H., Origgi, G., & Wilson, D. (2010). Epistemic vigilance. *Mind & language*, *25*(4), 359-393.

Sportelli, L. (2019). The Discovery, Development and Current Status of the Chiropractic Profession. *Integr Med (Encinitas)*, *18*(6), 20-22.

Steele, J. S. (2013). Longitudinal Data Analysis for the Behavioral Sciences Using R. *Structural Equation Modeling: A Multidisciplinary Journal*, *20*(1), 175-180. https://doi.org/10.1080/10705511.2013.742406

Stern, C., Jordan, Z., & McArthur, A. (2014). Developing the review question and inclusion criteria. *AJN The American Journal of Nursing*, *114*(4), 53-56.

Stilwell, P., & Harman, K. (2017a). Contemporary biopsychosocial exercise prescription for chronic low back pain: questioning core stability programs and considering context. *The Journal of the Canadian Chiropractic Association*, *61*(1), 6.

Stilwell, P., & Harman, K. (2017b). 'I didn't pay her to teach me how to fix my back': a focused ethnographic study exploring chiropractors' and chiropractic patients' experiences and beliefs regarding exercise adherence. *The Journal of the Canadian Chiropractic Association*, *61*(3), 219.

Stinckens, N., Ulburghs, A., & Claes, L. (2009). De werkalliantie als sleutelelement in het therapiegebeuren. *Meting met behulp van de WAV-12: de Nederlandse vertaling van de Working Alliance Inventory. Tijdschr Klin Psychol*, *39*, 44-60.

Stuber, K. J., Langweiler, M., Mior, S., & McCarthy, P. W. (2018). A pilot study assessing patient-centred care in patients with chronic health conditions attending chiropractic practice. *Complementary therapies in medicine*, *39*, 1-7.

Swain, M. S., Gliedt, J. A., de Luca, K., Newell, D., & Holmes, M. (2021). Chiropractic students' cognitive dissonance to statements about professional identity, role, setting and future: international perspectives from a secondary analysis of pooled data. *Chiropr Man Therap*, *29*(1), 5. https://doi.org/10.1186/s12998-021-00365-6

Tangkiatkumjai, M., Boardman, H., & Walker, D.-M. (2020). Potential factors that influence usage of complementary and alternative medicine worldwide: a systematic review. *BMC Complementary Medicine and Therapies*, *20*(1), 363. https://doi.org/10.1186/s12906-020-03157-2

Taylor, P. J., Rietzschel, J., Danquah, A., & Berry, K. (2015). The role of attachment style, attachment to therapist, and working alliance in response to psychological therapy. *Psychol Psychother*, *88*(3), 240-253. https://doi.org/10.1111/papt.12045

Team, R. C. (2023). *R Statistical language*. In (Version version 4.2.3) https://www.R-project.org/

Testa, M., & Rossettini, G. (2016). Enhance placebo, avoid nocebo: How contextual factors affect physiotherapy outcomes. *Manual therapy*, *24*, 65-74. https://doi.org/https://doi.org/10.1016/j.math.2016.04.006

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC medical research methodology*, *8*(1), 1-10.

Toporovsky, A., Fuertes, J. N., Moore, M. T., Anand, P., & Hungria, F. C. (2020). Physicians' and Patients' Ratings of the Physician-Patient Working Alliance, Adherence, Satisfaction, and Treatment Outcome. *Behavioral Medicine*, 1-28.

Torres, C., Rosenblum, K. L., Jester, J. M., Julian, M. M., Niec, L. N., Muzik, M., & Michigan Collaborative for Infant Mental Health, R. (2022). Clinician Racial Biases: Preliminary Investigation on Predictors of Poor Therapeutic Alliance and Retention in Home Visiting Intervention Program. *Maternal and Child Health Journal*, *26*(4), 953-961. https://doi.org/10.1007/s10995-021-03369-z

Tschacher, W., & Haken, H. (2019). *The process of psychotherapy*. Springer.

Underwood, M. R., Barnett, A. G., & Vickers, M. R. (1999). Evaluation of two time-specific back pain outcome measures. *Spine*, *24*(11), 1104-1112.

Unsgaard-Tøndel, M., & Søderstrøm, S. (2021). Therapeutic Alliance: Patients' Expectations Before and Experiences After Physical Therapy for Low Back Pain-A Qualitative Study With 6-Month Follow-Up. *Phys Ther*, *101*(11). https://doi.org/10.1093/ptj/pzab187

van der Schee, E., Braun, B., Calnan, M., Schnee, M., & Groenewegen, P. P. (2007). Public trust in health care: A comparison of Germany, The Netherlands, and England and Wales. *Health Policy*, *81*(1), 56-67. https://doi.org/https://doi.org/10.1016/j.healthpol.2006.04.004

Vermunt, N. P., Harmsen, M., Elwyn, G., Westert, G. P., Burgers, J. S., Olde Rikkert, M. G., & Faber, M. J. (2018). A three-goal model for patients with multimorbidity: A qualitative approach. *Health Expect*, *21*(2), 528-538. https://doi.org/10.1111/hex.12647

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection. *Medical care*, *30*(6), 473-483. http://www.jstor.org/stable/3765916

Wells, B. M., Salsbury, S. A., Nightingale, L. M., Derby, D. C., Lawrence, D. J., & Goertz, C. M. (2020). Improper Communication Makes for Squat: A Qualitative Study of the Health-Care Processes Experienced By Older Adults in a Clinical Trial for Back Pain. *J Patient Exp*, *7*(4), 507-515. https://doi.org/10.1177/2374373519860347

Wickham, H., Chang, W., Henry, L., Pedersen, T. L., Takahashi, K., Wilke, C., Woo, K., Yutani, H., & Dunnington, D. (2016). ggplot2: Create elegant data visualisations using the grammar of graphics. *R package version*, *2*(1).

Wijma, A. J., Bletterman, A. N., Clark, J. R., Vervoort, S., Beetsma, A., Keizer, D., Nijs, J., & Van Wilgen, C. P. (2017). Patient-centeredness in physiotherapy: What does it entail? A systematic review of qualitative studies. *Physiother Theory Pract*, *33*(11), 825-840. https://doi.org/10.1080/09593985.2017.1357151

Willig, C. (2012). Perspectives on the epistemological bases for qualitative research.

Willig, C. (2013). *EBOOK: introducing qualitative research in psychology*. McGraw-hill education (UK).

Wiltshire, G., & Ronkainen, N. (2021). A realist approach to thematic analysis: making sense of qualitative data through experiential, inferential and dispositional themes. *Journal of Critical Realism*, *20*(2), 159-180.

Winterowd, S. a. (2007). *Physician-patient attachment scale*. [Unpublished modified version of the Inventory of Parent and Peer Attachment.].

Yalden, P., Cunliffe, C., & Hunnisett, A. (2013). An investigation into the demographics and motivations of students studying for a chiropractic degree. *J Chiropr Educ*, *27*(2), 128-134. https://doi.org/10.7899/jce-13-8

Yan, M., Zhou, W., Shu, H., Yusupu, R., Miao, D., Krügel, A., & Kliegl, R. (2014). Eye movements guided by morphological structure: Evidence from the Uighur language. *Cognition*, *132*(2), 181-215. https://doi.org/https://doi.org/10.1016/j.cognition.2014.03.008

Yardley, L., Sharples, K., Beech, S., & Lewith, G. (2001). Developing a dynamic model of treatment perceptions. *Journal of Health Psychology*, *6*(3), 269-282.

Zilcha-Mano, S., & Fisher, H. (2022). Distinct roles of state-like and trait-like patient–therapist alliance in psychotherapy. *Nature Reviews Psychology*, *1*(4), 194-210. https://doi.org/10.1038/s44159-022-00029-z

Zilcha-Mano, S., Roose, S. P., Brown, P. J., & Rutherford, B. R. (2019). Not just nonspecific factors: The roles of alliance and expectancy in treatment, and their neurobiological underpinnings. *Frontiers in behavioral neuroscience*, *12*, 293.

Zuur, A. F., Ieno, E. N., Walker, N. J., Saveliev, A. A., & Smith, G. M. (2009). *Mixed effects models and extensions in ecology with R* (Vol. 574). Springer.