



Developing Chiropractic Students Clinical Practice Skills—

Elements of Best Practice: A Qualitative Exploratory

Descriptive Study

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Abstract

Background

Although chiropractic has 125 years as an established profession, scrutiny of the literature proves that few studies have examined the clinical education of chiropractic students with a call for research from academics. This thesis is significant as it develops knowledge that can inform chiropractic bodies and help them improve an essential component of chiropractic education: clinical skill development.

Research Purpose and Aims

The purpose of this study was to identify elements of best practices in clinical education by critically examining, exploring and describing the aspects of an exemplar chiropractic clinical program that develops students' clinical practice skills for transition into practice. This study explored the innovative clinical program of a reputable American chiropractic institution providing a scaffolded clinical program across varied clinical settings, patient populations and amongst other health disciplines.

Research Design

A six-phase exploratory descriptive qualitative design (EDQD) study was conducted to explore and describe the phenomenon being examined (Flick, 2014). This design enabled the collection of information about perceptions and lived experiences of three stakeholder cohorts: clinical faculty members, students and new graduates.

Methods

Purposive sampling (of students and clinical faculty members) and snowball sampling techniques (of new graduates) were used to derive the sample. Data were collected in three cycles across a two-year period using in-depth, semi-structured interviews.

Interviews were conducted with 15 clinical faculty members and eight new graduates, and semi-structured focus groups were conducted with 20 students. All data were audio recorded, transcribed and thematically analysed using an inductive approach.

Findings

Chiropractic clinical education programs ought to be developed within a framework that incorporates adult learner principles; situated, social and experiential learning theories. Valued was a student-centred learning experience that includes authentic and diverse clinical placements, supervision and mentoring from multiple clinical educators which enhances students' access to varied perspectives of clinical practices that contributes to developing clinical skills and professional identity. Business knowledge and entrepreneurial skills was an area of deficiency, which is problematic when the objective is to build graduates' independence in clinical practice and professional prospects are predominantly private practice (NBCE, 2020). Embedding evidence-based practice within curricula and clinical training for educators and students are necessary to ensure this becomes a part of clinical practice.

Conclusion

This thesis posits best practice in chiropractic clinical education consists of the following: (a) using a scaffolded longitudinal clinical program, (b) varying clinical placements and case mix, (c) supervision and mentoring from multiple clinical educators, (d) educating the clinical educator, (e) curricula designed around industry standards and desired graduate attributes and capabilities, (f) an evidence-based practice approach in the curricula and clinical context, (g) aligning business skills, knowledge and practices with the professional context and (h) interprofessional learning and practice opportunities. Although this study has made a contribution to scholarly discourse, there remain many gaps in our knowledge where further studies are needed.

Acknowledgements

Many people have supported me and contributed to the completion of this research and thesis. This research commenced under the supervision of Dr Linda Jones, who was integral to the development of the research design and project. The early stage of this study was a period when I felt like a novice faced with trying to attain a higher degree by research using my own research knowledge and profile. Linda assisted, helped, supported and encouraged me, ultimately setting me on the right track.

Moving my project to Federation University Australia came with the assignment of two new supervisors, Professors Colette Browning (as the primary supervisor) and Simon Cooper (as the secondary supervisor), who have both been integral to the refinement and completion of this thesis, especially in the final stages of my candidature. Since both of my supervisors are from health disciplines other than chiropractic, they brought with them valuable interprofessional perspectives that have helped me in my study. Both supervisors have been exceptional in their attention to my study, which I can imagine was also challenging for them as they adopted me as a student in the final stages of my research and candidature.

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Furthermore, has been the support and love shown from all of my family members. My sister, Kelly, always calling and checking in on my spirit. The help from my parents and in-laws so that I may conduct my research and conference presentations overseas, knowing that my boys would be well taken care of.

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Signed Declaration

I hereby certify that the work within this thesis is the result of original research.
The project was self-funded. This thesis has also not been submitted for a higher degree
in any other university.

Navine Haworth

Date: 26/04/2021

Signed:

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Dedication

I dedicate this thesis to my husband, who has supported me in my educational and research endeavours. His encouragement and faith in me have seen me through. This thesis is also dedicated to our three amazing sons, Tyler, Logan and Adam, whose working memory has been of their mother as a stressed-out student. Despite this, my sons have continued to show me their patience, understanding and unconditional love. My husband and sons gave me the strength to complete this thesis.

List of Abbreviations

ALT	adult learning theory
CAIPE	Centre for the Advancement of Interprofessional Education
CAM	complementary and alternative medicine
CCE	Council on Chiropractic Education
CCEA	Council on Chiropractic Education Australasia
CCEC	Council on Chiropractic Education Canada
CE	clinical educators
CIP	clinical immersion placements
CLE	clinical learning environment
CLM	clinical leadership and management
CMCC	Canadian Memorial Chiropractic College
CoP	Communities of practice
DCP	Doctor of Chiropractic Program
DOD	Department of Defense
EBE	evidence-based education
EBM	evidence-based medicine
EBP	evidence-based practice
ECCE	European Council on Chiropractic Education
EDQ	exploratory descriptive qualitative
ELT	experiential learning theory
FG	focus group
HPE	health profession education
IPE	interprofessional education

IPL	interprofessional learning
IPP	interprofessional practice
LJ	Linda Jones
LPP	legitimate peripheral participation
MD	medical doctor
NG	new graduate
NH	Navine Haworth
PBL	problem-based learning
PICO	patient problem (or population), intervention, comparison or control, and outcome
RMIT	Royal Melbourne Institute of Technology
SLE	service-learning experience
SLT	situated learning theory
UHC	university health clinics
US	United States
USA	United States of America
VA	Veterans Affairs
WFC	World Federation of Chiropractic
WHO	World Health Organization

Glossary of Terms

Collaborative practice: The type of practice where multiple professionals work together towards a mutually agreed vision of how to provide care that is safe, of high quality, compassionate, integrated and person centred. The collaborative process is underpinned by a culture where everyone's contribution is valued, and it empowers staff to embrace change and engage with innovation (Lindqvist et al., 2017).

Doctor-driven model: A model where the chiropractic clinical educator is engaged with patient care and the supervision of students aimed to provide quality patient care and maximise the educational benefit to the student.

Integrated care: Care that is provided by multiple health and social care workers from different professional backgrounds who collaborate interprofessionally across settings in a way that has optimal outcomes for each person in need of care and those who provide it (Lindqvist et al., 2017).

Interprofessional: A term that describes situations involving two or more professions or professionals.

Interprofessional education: The type of education where “two or more professionals learn about, from and with each other to enable effective collaboration and improve health outcomes” (CAIPE, 2002 p.6).

Interprofessional learning: “When two or more professions learn with, from and about each other to improve collaboration and the quality of care” (CAIPE, 2002 p. 6).

Interprofessional practice: The type of practice that involves health workers from different professional backgrounds working together with patients, families, carers, communities and each other to deliver healthcare.

Multiprofessional education: The type of education “where people from two or more professions learn side by side for whatever reason” (Barr, 2002 p.6).

Professional: An individual with the knowledge and/or skills to contribute to the physical, mental and social wellbeing of a community.

Uniprofessional: A term to describe situations when students learn together as a single group (e.g., nurses, doctors, dentists, midwives, allied health professionals or social workers) and do not learn with or alongside other professional groups. Uniprofessional includes the process where educational activities occur only among students within the same profession and in isolation from other professions.

Uniprofessional practice: The type of practice where healthcare workers work with others of the same professions or discipline.

Publications and Presentations

Conference Presentations

Platform

Haworth, N., Moore, K., Horstmanshof, L. (2019). *Chiropractic student and new graduate perception of institution versus community based clinical educational experience*. Association Chiropractic Colleges Research Agenda Conference 2019 (in Baltimore, Maryland, USA) on 15th-17th March 2019.
Achievement: Award recipient for platform presentation by NBCE for Best Educational Paper.

Vaughan, B., Parry, D., **Haworth, N.** (2019). *'Useful' and 'useless': written feedback and the miniCEX*. Australian Chiropractors Association National Convention (in Melbourne, Australia) 19th-20th October 2019.

Haworth, N., Moore, K., Horstmanshof, L. (2019). *Chiropractic and Osteopathic student perception of university health clinic (UHC) versus community clinic (CC) educational experience*. Australian Chiropractors Association National Convention (in Melbourne, Australia) 19th-20th October 2019.

***Haworth, N., Jones, L.** (2017). *Student and new graduate perception of hospital versus institution traditional clinic in clinical educational experience*. Chiropractors' Association of Australia National Conference (in Canberra, Australia) on 20–21 October 2017. Achievement: Delegate research award recipient for best platform presentation.

***Haworth, N., Jones, L. (2017).** *Student and new graduate perception of hospital versus institution traditional clinic in clinical educational experience.* Association Chiropractic Colleges Research Agenda Conference/World Federation of Chiropractic Conference 2017 (in Washington DC, USA) on 15th-18th March 2017.

Haworth, N., Moore, K., Horstmanshof, L. (2019). *Chiropractic and Osteopathic student perception of university health clinic (UHC) versus community clinic (CC) educational experience.* Australian Chiropractors Association National Convention (in Melbourne, Australia) 19th-20th October 2019.

Haworth, N., Moore, K., Horstmanshof, L. (2019). *How well are students prepared to work with other health professions when they transition to practice?* Australian Chiropractors Association Conference 2019 (in Melbourne, Australia) on 20th October 2019.

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- *Haworth, N. & Jones, L. (2017a).** Exploration of new graduate collaboration experiences [Abstract]. *Journal of Chiropractic Education*, 31(1), 63. <https://doi.org/10.7899/JCE-16-18>
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- *Haworth, N. & Jones, L. (2017c).** SWOT analysis of chiropractic education and services provided within the hospital setting according to students, residents and new graduates of a North American chiropractic program [Abstract]. *Journal of Chiropractic Education*, 31(1), 63. <https://doi.org/10.7899/JCE-16-18>
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Chapter 1. Introduction and Background

1.1. Introduction

The purpose of this thesis was to identify elements of best practices in the clinical education of chiropractic students. This was achieved through critically examining, exploring and describing the aspects of a chiropractic clinical program that develops students' clinical practice skills in their transition into clinical practice.

This chapter presents the background of the study and the theoretical frameworks applied, as well as the study aims, objectives, significance, scope, methods and an overview of the thesis structure. The next chapter will present the narrative review of the literature related to the research question addressed in this thesis.

1.2. Background

1.2.1. The Purpose of Clinical Education

One purpose of clinical education is to assist a student in the acquisition of the required knowledge, skills and attitudes in practice settings to meet the standards defined by a professional accrediting or licensing board (Rose & Best, 2005). For students of health profession education (HPE), clinical education assists in developing their practical skills and integrating theory with practice in a real-world environment (Abey et al., 2015). Furthermore, Paschal (2013), quoting from Callahan et al. (1968), suggests that the purpose of clinical education is “to assist the student to correlate clinical practices with basic sciences; to acquire new knowledge, attitudes and skills; to develop an ability to observe; to evaluate; to develop realistic goals and plan effective treatment programs; to accept professional responsibility; to maintain a spirit of inquiry and to develop a pattern for continuing education” (Paschal, 2013,

p. 145). Despite being an historic quote, it is relevant to current clinical education (Paschal, 2013).

Clinical education is a complex phenomenon that aims to transform students into practitioners within a fieldwork setting, otherwise referred to as a service-learning experience (SLE) or a clinical learning environment (CLE) (Higgs, 1992). Most contemporary healthcare curricula strive to produce autonomous, competent professionals who can demonstrate discipline-specific technical competencies and act professionally (Higgs,1992). In addition to acquiring their clinical and management skills, clinical education aims for health students to develop their professional identity and prepare for the complexities of real-world practice (Higgs,1992). Students and graduates need to employ these settings to develop their clinical-reasoning skills and management skills (Higgs, 1991). For that reason, it has been stated that the clinical educators' (CE) role is to prepare students to be competent beginning practitioners who can meet the demands of competent practice and the workforce (Higgs & Mcallister, 2007).

Three decades ago, prominent Australian health education scholars, Higgs et al. (1991) identified seven goals and principles of clinical education in the healthcare professions that are applicable worldwide and across health disciplines. These goals and principles state that the student is expected to develop:

1. an awareness of health, holistic health care and the healthcare system;
2. awareness of one's attitudes, values and responses to health and illness;
3. a broad understanding of the roles of the healthcare team;
4. interpersonal skills and the ability to educate others effectively;
5. clinical competencies relevant to the student's discipline, including clinical-reasoning skills, psychomotor competencies, interpersonal skills and communication skills;

6. the ability to critically evaluate personal and professional practice; and
7. a sense of accountability and commitment to the continued development of competence and lifelong learning.

The stated goals are achieved through the integration of theory and practice vis- à-vis, through the development of the students' clinical reasoning, psychomotor skills, clinical examination skills, treatment skills and ability to articulate the rationale for treatment and evaluate treatment outcomes (Higgs, 1992; Strohschein, Hagler & May, 2002).

Many factors influence and contribute to the students' clinical-training experience as they develop the graduate attributes needed for the profession. Perceptions of best practice in clinical education are diverse, multifaceted and somewhat dependent upon the health profession itself in its specific requirements (Rose & Best, 2005). The notion of the 'one size fits all' is unlikely to apply to clinical education because of the diverse needs of students, patients, CE and supervisors, and the profession (Rose & Best, 2005).

The expectations and standards required in the professional environment also need to be considered. The student needs in a medical, nursing or chiropractic discipline will invariably differ according to the usual and customary clinical setting of their training and professional practice, for example, a hospital compared to a private practice setting. A chiropractic practitioner's usual professional setting is the private practice setting, as there are very few positions available in the community and hospital sector (NBCE, 2020).

Chiropractic students have traditionally received their clinical training in college-based or institution-based clinics (Wyatt et al., 2005; Karim & Ross, 2008; Murphy et al., 2008), with only some institutions offering hospital clinical placement opportunities (Dunn, 2005, 2006, 2007; Humphreys & Peterson, 2016; Kopansky-Giles et al., 2007; Myburgh, 2009; Myburgh & Mouton, 2008; Plexuss, n.d.; Rome, 2016; Walker, 1998). Furthermore, the chiropractic students' experience of seeing patients in the college clinics is not reflective of the

professional practice experience due to the limited patient case mix and complexity typically presenting within the college teaching clinics (Wyatt et al., 2005).

What is important in the context of this thesis are the objectives of chiropractic education: to cultivate clinical confidence in novice practitioners (Morgan & Morgan, 2006), to enable them to reach an acceptable level of clinical competency in chiropractic practice (Lady & Takaki, 2018) and to foster professional confidence and competence in patient communication and clinical skills as expected of graduate chiropractors (Hecimovich & Volet, 2009).

The research presented in this thesis explores an area of chiropractic education where there is a dearth of research (Puhl, et al., 2017): best practice in the clinical education of chiropractic students; what are elements that develop their clinical practice skills. In particular, the importance of the student clinical placement experience of clinical education.

1.3. The Chiropractic Profession

Chiropractic originated in 1895, in the mid-western region of the United States of America. The founder, D. D. Palmer, performed the first chiropractic adjustment and continued to develop chiropractic, establishing the first teaching institution and program of chiropractic—Palmer School of Cure—two years later. The school later became Palmer College of Chiropractic, located in Davenport, Iowa (American Chiropractic Association, n.d.). The United States of America (USA) has remained the leader in offering chiropractic education.

Chiropractic is concerned with the diagnosis, treatment and prevention of neuromuscular disorders and their effects on general health (World Health Organization [WHO], 2005). Chiropractic is practised worldwide in 90 countries, regulated by law in some 68 countries (Stochkendahl et al., 2019). In the Western world, the chiropractic profession is

the third-largest physician-level independent health profession after medicine and dentistry (Hawk, 2017).

The regulations for chiropractic practice vary across countries. Countries with frameworks that legally recognise chiropractic have formal university degrees for a professional qualification, professional regulation and prescribed educational qualifications (WHO, 2005). In countries where chiropractic is not legally established, other health professionals and lay practitioners may utilise the technique as a chiropractic service without obtaining a recognised or accredited qualification (WHO, 2005).

The World Federation of Chiropractic (WFC) is a not-for-profit organisation as well as a non-government organisation of the WHO (WFC, n.d.b). The recent *WFC Principles* includes 20 principles that support “the rights of chiropractors to practice according to their training and expertise” (WFC, 2019, p. 1). Principle 6 includes evidence-based practice (EBP) and care aligned with the views espoused by Michael Sackett of “integrating individual clinical expertise, the best available evidence from clinical research, and the values and preferences of patients” (WFC, 2019, p. 1).

The role of chiropractic care includes the “chiropractic adjustment, to enhance function, improve mobility, relieve pain, and optimise wellbeing” (WFC, 2019, p. 1). Furthermore, it has been stated that chiropractors should be an engaged team member in providing interprofessional patient care that facilitates optimum patient outcomes and should be “responsible public health advocates to improve the wellbeing of the communities they serve” (WFC, 2019, p. 1). Regarding chiropractic education, the WFC support “high standards of chiropractic education that empower graduates to serve their patients and communities as high value, trusted health professionals” (WFC, 2019, p. 1).

Chiropractic is often referred to as a discipline sitting within the complementary (Ernst & Smith, 2018; Meeker & Haldeman, 2002; Zollman & Vickers, 1999), alternative

(Ernst & Smith, 2018; Meeker & Haldeman, 2002) or allied health sector (Australian Government Department of Health, 2013) of the health system. Meeker and Haldeman (2002) see chiropractic as making substantial changes, moving away from ‘alternative care’ through research efforts concentrated on spinal manipulation. Whether it will move towards a mainstream form of care, where chiropractic and chiropractors become fully integrated into all healthcare systems, is unclear (Meeker & Haldeman, 2002). While chiropractic has begun to embrace the values and behaviours of a mainstream health profession, structural barriers to mainstream status seem to hinder chiropractic. The alternative healthcare professional status is mainly due to the image, practice and remaining profession vestiges (Meeker & Haldeman, 2002).

1.3.1. The Chiropractic Workforce

A recent cross-sectional survey of the global chiropractic workforce shows that the total number of chiropractors was 103,469, with the number of chiropractors per country ranging from one to 77,000 (Stochkendahl et al., 2019). The USA has the most chiropractors per capita, with 23.7 chiropractors for every 100,000 people; India has the lowest number of chiropractors—0.0007 chiropractors for every 100,000 people (Stochkendahl et al., 2019). The density of chiropractors per capita in Australia is similar to North America (Stochkendahl et al., 2019). Thus, with such a large workforce and so many institutions preparing graduates, it is imperative that studies evaluate the educational outcomes of chiropractic clinical education programs. Previous studies that have explored and evaluated the quality of the learning environment in health professions programs have mostly focused on medical and nursing education programs, compared to little research conducted on other health professions programs (Rusticus et al., 2021).

1.4. Chiropractic Education and Training

From these American origins, chiropractic teaching programs have been established in 48 institutions across 19 countries (Stochkendahl et al., 2019); 18 of these programs are within North America (WFC, n.d.a).

According to WHO guidelines on basic training and safety in chiropractic (2005), chiropractic training includes not less than 4200 student–teacher contact hours, in four years of full-time education, with approximately 1000 hours of supervised clinical training (WHO, 2005). This level of education and training allows chiropractors to practise as primary contact healthcare providers, either independently or as members of healthcare teams in community healthcare centres or hospitals (WHO, 2005).

A significant proportion of the chiropractic curriculum consists of ‘hands-on’ practical experiences in the clinical program, evaluating and caring for patients. Students complete a minimum of one year of supervised clinical internship (Chiropractors’ Association of Australia, 2016; Puhl et al., 2017; Wyatt et al., 2005), sometimes alongside regular classroom delivery (Wyatt et al., 2005). The objective of clinical education is to prepare graduates with the diagnostic and management skills necessary to manage a range of health conditions within their competence and to deliver public health education within a biopsychosocial framework (Chiropractors’ Association of Australia, 2016).

Since the Palmer School of Cure in 1897, American chiropractic educational institutions have traditionally been private establishments mostly offering chiropractic programs only (American Chiropractic Association, n.d.), with few also offering programs in naturopathy (Keating et al., n.d.a; Siordia & Keating, 2005). These single profession institutions have been the mainstay for approximately 94 years (University of Bridgeport, 2019), meaning chiropractic has been taught in isolation from other health professions (Karim & Ross, 2008). In 1991, the University of Bridgeport was one of the first universities

in North America to offer a chiropractic program, among other health programs, in a university setting (University of Bridgeport, 2019; Wikipedia, n.d.). Since then, many chiropractic schools have converted into universities, suggesting that this is in seeking an alternative to what was considered the status quo (Wyatt et al., 2005). Outside the North American context, most chiropractic programs are within publicly funded universities with a large student enrolment, a broad base of academics, and direct accountability to the government (Ebrall, Draper, Repka, 2008).

In parts of Europe and the United Kingdom, chiropractic has been making considerable progress in terms of university-based education (Byfield, 2010). From the European perspective, chiropractic programs offered within a university setting include that of the University of Zurich; in the Master of Chiropractic Medicine, students spend the first four years studying the Human Medicine Program curriculum in full (Humphreys & Peterson, 2016; University of Zurich, n.d.). This program commenced in 2008 as a program fully integrated with the medicine discipline (Humphreys & Peterson, 2016). Another European university-based chiropractic program is offered by the University of Southern Denmark. The first student cohort of chiropractors graduated from the University of Southern Denmark in 1999, and the program received accreditation in 2002 from the European Council on Chiropractic Education (European Council on Chiropractic Education [ECCE] Commission on Accreditation, 2013a). The program itself is offered within a university setting and alongside the medicine discipline, with which it shares many streams of the Bachelor portion of the program. Like the program offered by the University of Zurich, the program at the University of Southern Denmark involves interprofessional education (IPE) and interprofessional learning (IPL) across the clinical and overall program (Myburgh et al., 2008; Myburgh, 2009; Myburgh & Mouton, 2008).

1.5. Chiropractic Education Accreditation

In the initial days, the educational standards of chiropractic education were proprietary (Vear, 1992). There were no forms of control other than the competition between chiropractic institutions (Vear, 1992). The accreditation of chiropractic programs emerged in 1935, when the National Chiropractic Association created the Committee on Educational Standards to advocate for high standards for the profession. The profession refined and reformed its committee to focus on academic rigour for educational institutions. The Council on Chiropractic Education (CCE- USA) was formed in 1971 and received federal approval in the USA in 1974 (Vear, 1992).

To this day, the councils on chiropractic education remain the accrediting authorities for chiropractic. The councils provide curriculum guidelines and standards of the expected competencies and capabilities of the graduate, with the expectation that they will become a safe practitioner (Canadian Federation of Chiropractic Regulatory and Educational Accrediting Boards, 2011; Council on Chiropractic Education Australasia [CCEA], 2003; CCE, 2012, 2013, 2020; Councils on Chiropractic Education International, 2016; ECCE, 2011). The councils expect chiropractic programs to train students towards the attainment of competencies—satisfactory levels of knowledge, skills and attitudes before graduating (Innes et al., 2016b).

These competencies guide the development of curricula so that students graduate from an accredited program that permits professional registration (Canadian Federation of Chiropractic Regulatory and Educational Accrediting Boards, 2011; CCE, 2013, 2020; CCEA, 2003; Councils on Chiropractic Education International, 2016; ECCE, 2011). There are four councils of chiropractic education responsible for accrediting chiropractic programs. These include the US-based CCE, the ECCE, Council on Chiropractic Education Canada (CCEC) and the CCEA (Innes et al., 2016b). These four councils function under the umbrella

of the organisation of the Councils on Chiropractic Education International (Innes et al., 2016b).

A recent systematic review that examined the definitions and descriptions of accreditation standards of the various councils found that all councils provide a general expectation in the provision of teaching clinics (Innes et al., 2016b). These teaching clinics should be appropriately resourced for the delivery of clinical training for students and have mechanisms to determine if patient care deficiencies existed (Innes et al., 2016b). The majority of the councils expect a sufficient case mix of patients within the clinical-teaching environment. Additional requirements include proof that the clinics meet the mission and objective statements of the chiropractic program and provide sufficient supervision of students (Innes et al., 2016b).

Minor inclusions that are unique to the CCEA are the standard of patient-centred care (Innes et al., 2016b) and that clinical-training facilities consist of clinics, other community healthcare settings and skills laboratories (CCEA, 2009). ECCE specifically requires the length of clinical training to be a minimum period of one year. All councils have set quantitative requirements for the number of new patient and patient treatment interactions, although differences exist in their minimum thresholds (Innes et al., 2016b). The CCEA has historically set the highest level of quantitative patient interactions in the 2009 standards—higher than all other councils (Innes et al., 2016b).

1.6. Chiropractic Clinical Education

In North America, chiropractic is the largest of the complementary and alternative medicine (CAM) health professions (Chapman-Smith, 2010). CAM refers to a group of therapeutic and diagnostic disciplines that exists largely outside the institutions where conventional health care is taught and provided (Zollman & Vickers, 1999). To date, there has been little attention given to the formal curriculum of chiropractic education in the health

sciences literature (Coulter, et al., 1998; Johnson & Green, 2010; Mrozek, et al., 2006) and comparisons between chiropractic and medical education (Coulter et al., 1998; Johnson & Green, 2010; Palmgren et al., 2018) and allied health education (Murphy et al., 2008; Palmgren et al., 2018).

Yet, chiropractic academics have perceived the need for chiropractic education to move away from old curricular models and towards medical education (Johnson & Green, 2010). After reviewing the literature on chiropractic and medical education, Wiles (2020) recommends:

1. an emphasis on EBP and interprofessional collaboration;
2. an emphasis on experiential learning rather than lecture-based instruction;
3. the introduction of early and sustained clinical exposure and experiences;
4. an emphasis on case-based relevancy in all courses, particularly in the early semesters; and
5. an emphasis on critical reasoning ('thinking like a scientist') and clinical reasoning ('thinking like a doctor') (Wiles, 2020).

It has been widely known that chiropractic students, for the most part, work in institution-based clinics; their first patient interactions commence in the later stages of the program when they attain patient privileges. Here, they are required to recruit their patients, who are usually healthy—a direct contrast to the medical students' clinical experiences (Morgan & Morgan, 2006).

Questions have been asked as to “whether current clinical training in chiropractic education is meeting the demands of a new era in health care, in which all primary contact healthcare professionals face ongoing change and increasing challenges” (Richards, 2011, p. 52). Fourteen years ago, Morgan and Morgan (2006) suggested that the way to improve clinical training in the chiropractic context is to expand clinical opportunities to include

hospital and specialty care centres. In these settings, chiropractic students are more likely to have broader experiences with patients, conditions and diagnostic processes (Morgan & Morgan, 2006). Being innovative in healthcare opportunities could include clinical environments across a variety of community and hospital settings, where there is a higher likelihood of interprofessional practice (IPP) (Richards, 2011). Thus, there is a need to further explore and critique the clinical-training methods within chiropractic programs.

Recent research has shown that in the local context, there is limited involvement of chiropractors in Australian hospitals (Rome, 2016). This has been limited in the care of patients unless the practitioner has further medical qualifications. When compared to emerging trends in the international context, Australia is way behind in this area with no formal chiropractic appointments in any hospital (Rome, 2016). While there are numerous opportunities for chiropractic hospital placements in many countries, especially within the USA, there is resistance to this type of collaboration in Australia (Rome, 2016). Hospital placements for Australian chiropractic students are not currently available, nor do they appear to be an option in the foreseeable future (Haworth et al., 2020; Rome, 2016; Walker, 2016). Conversely, in the European programs, such as at the University of Zurich, University of Southern Denmark, and several North American chiropractic programs—hospital placements are part of the undergraduate or internship programs (Dunn, 2005, 2006, 2007; Humphreys & Peterson, 2016; Kopansky-Giles et al., 2007; Myburgh, 2009; Myburgh & Mouton, 2008; Plexuss, n.d.).

There have been several narratives from chiropractic academics and leaders that recommend chiropractic programs change the chiropractic educational profile and graduates of chiropractic programs (Ebrall, 2018; Ebrall et al., 2009; Institute for Alternative Futures, 2013; Murphy et al., 2008; Walker, 2016; Wyatt et al., 2005). Yet, there is little research into chiropractic clinical education, specifically (Puhl et al., 2017). Thus, this topic was

investigated from a foundational perspective, drawing from other professions to inform the research.

Overall, there are concerns with certain deficiencies in meeting and providing best clinical practice standards in the local context of chiropractic programs (Ebrall, Draper, Repka, 2008; Ebrall, 2018; Walker, 2016). Wyatt and colleagues (2005) in their paper from the American perspective, opine that there is much to improve within the local and international chiropractic context of clinical education (Wyatt et al., 2005). However, there is still a paucity of evidence as to what is best practice for chiropractic clinical education and how that relates to service learning in the chiropractic literature (Boysen et al., 2016).

There is a major transition that happens when a new chiropractic intern is placed in the CLE. A particularly important one is knowledge transfer and integration, that is, learning how to turn the theoretical or ‘classroom knowledge’ into a clinical application (Stick-Mueller et al., 2010). For students, formulating patient management plans, clinical techniques and applying them to a patient can be daunting (Stick-Mueller et al., 2010). While this is such an important component of the chiropractic curriculum and program, there is little research devoted to clinical education in chiropractic (Puhl et al., 2017; Mrozek et al., 2006). Overall, there is a gap in the knowledge and literature specific to chiropractic clinical education, hence the necessity for this research.

1.7. Differences Between Chiropractic and Medical Education

The primary aim of this study is not to compare medical and chiropractic curricula; this section provides background information only. When comparing chiropractic and medical education, chiropractic programs have been perceived as deficient in experiential learning and clinical education (Morgan & Morgan, 2006; Richards, 2011). Direct criticisms have included that virtually all of the chiropractic students’ learning takes place in the classroom and that the clinic clerkships have “been mostly an insipid application of

classroom knowledge” (Morgan & Morgan, 2006, p. 21). Furthermore, concerns have been raised about the limited patient case mix for chiropractic students due to the type of clinical placements; chiropractic students tend only to see certain types of patients, and a wider variety of patients are needed (Richards, 2011). Medical students commence their program with patient experiences in a clinical setting and experiential learning from the beginning of their program. In contrast, the typical chiropractic program focuses on didactic delivery, with patient and clinical-based experiential learning introduced in the later stages (Richards, 2011). Because of this didactic delivery model, there is a propensity towards producing “fact spewing robots, rather than the sensitive, compassionate, caring and skilled doctors we desire” (Morgan & Morgan, 2006, p. 22). Hence, criticisms and suggestions for improvements in chiropractic clinical education have been motivated by direct comparisons with medical clinical education, including the types of clinical placements, students’ experience with the patient case mix, and experiential learning being embedded over the entirety of the program (Morgan & Morgan, 2006; Richards, 2011).

1.8. Theoretical Frameworks

Primarily, this research has been designed to explore the elements of best practice in chiropractic students’ clinical education, particularly the students’ clinical placements. To that end, it is critical to explore the application of the four most relevant, overarching theoretical frameworks that most chiropractic academics expect would be applied during the clinical education planning, management and the clinical experience of students, patients and supervisors. Four applicable theories to this study are further divided into a) the underpinning theories that describe the importance of students’ engagement with professionals of their own discipline (1.8.1, 1.8.2, 1.8.3) and b) approaches students adopt in their learning (1.8.4). The theories that describe the importance of students’ engagement with professionals of their own discipline are:

1.8.1. Social Learning Theory

Whenever students are in the presence of professionals working in their field of study, it is expected they will learn much from the behaviours, attitudes and skills displayed by the professional. Bandura's social learning theory emphasises how specific behaviours can be learned through observation and imitation (Cherry, 2018). Bandura proposes four mediational processes:

1. Attention: the extent to which we are exposed to or notice the behaviour;
2. Retention: how well the behaviour is remembered;
3. Reproduction: the ability to perform the behaviour that has just been demonstrated;
and
4. Motivation: the will to perform the behaviour (Bandura, 1997).

Because Bandura's various models relate to the social learning that occurs within the SLE, this thesis will explore the three stakeholder perceptions of the interactions between students and their CE and mentors when providing patient care. The thesis explores the extent to which social learning theory is applied during chiropractic clinical education within the clinical placement setting.

1.8.2. Situated Learning Theory

When students engage in learning events in the professional setting, such as the chiropractic health services provided in the CLE, the students' experience is referred to as 'situated learning'. Wenger developed the situated learning theory (SLT) as another type of educational theory that includes two crucial learning elements: context and community (Choi & Hannafin, 1995; Lave & Wenger, 1991; Wenger, 1998). This concept emphasises the importance of 'communities of practice' (CoP) in guiding and encouraging the learner, that knowledge should be learned in the same place as it used (Drew, n.d.). It is a process that occurs through legitimate peripheral participation (LPP) in CoP (Lave & Wegner, 1991). The

teacher adopts the role of expert through their utilisation of scaffolding, coaching and modelling techniques (Dennen, 2004). In this study, data will be appraised for evidence of educators approaches to students' supervision and mentoring in preparing future graduates in the various CLE.

1.8.3. Experiential Learning Theory

Within the chiropractic pre-professional curriculum, clinical education events are considered the 'quintessential experiential' learning moment (Morgan & Morgan, 2006). Therefore, it is important to identify evidence of the application of experiential learning theory (ELT) in any evaluation of a clinical program. Kolb's ELT (1984) is the third theory that guides and supports students in their learning journey. A four-stage cycle of learning that combines experience, perception, cognition and behaviour; knowledge is created through the transformation of experience (Kolb, 2014). This theory is further discussed in Chapter 3.

This theory shows how students learn in practical and clinical settings, whereby learning is the creation of knowledge through the transformation of experience and depends on the context of that experience (Mahmoud, 2015). Again, the extent to which there is evidence of clinical teaching that reflects the experiential-learning cycle in participating institutions will be determined by analysis of the data collected.

1.8.4. Adult Learning Theory

Adult learning theory (ALT) applied to this study as the students whose involvement in the clinical education activities being investigated are adults. This theory refers to how adult students tend to be learner centred (Collins, 2004), self-directed, internally motivated, relevance oriented and ready to learn (Collins, 2004; Learning Theories, n.d.). Furthermore, it has been argued that adults learn more effectively through experiential techniques (Brookfield, 1986; Brundage & MacKeracher, 1980; Health Education and Training Institute [HETI], 2012), such as the clinical setting, as they are looking for practical, problem-centred

approaches to learning (Learning Theories, n.d.). Taylor and Hamdy (2013) propose that the CLE is an ideal field for using ALT and demonstrating its utility. The extent to which this theory is applied in planning and conducting clinical education events in the various clinical settings of the chiropractic curriculum is unknown.

1.9. Rationale for This Study

Chapter 2 will describe the gap in the chiropractic literature and the deficit of research in this particular research area. Chiropractic academics acknowledge that there is little published information within chiropractic education in relation to service learning (Boysen et al., 2016; Palmgren et al., 2018; Puhl et al., 2017). The rationale for this study is that while there may be evidence for what constitutes best practice in clinical education in other health professions and disciplines, there is little evidence in the chiropractic context (Haworth et al., 2020; Haworth & Jones, 2019; Palmgren et al., 2018; Puhl et al., 2017). As there is a dearth of literature in chiropractic clinical education, it is anticipated that this study will contribute to the scholarly literature as well as inform, enhance and contribute to the clinical education of chiropractic programs in the countries where it is a legally recognised profession with accredited programs. This study was conducted in six phases, commencing with a narrative review of the literature, followed by an exploration of a single chiropractic program across three stakeholder groups (Phases 2-4) to identify elements of best practice within their clinical program. After performing a detailed analysis and reporting of the perspectives of three stakeholder groups (Phase 5), this thesis makes recommendations for chiropractic clinical education and future research to address gaps outside the scope of this project (Phase 6).

The findings and recommendations from this thesis have the potential to have an influence on chiropractic clinical education.

1.10. Significance of the Thesis

This thesis will add to the scarcity of research on this topic and develop discussion, exploration and future research on best practice. Through the exploration of the literature, as well as the data gathered from participants, this study aims to influence the chiropractic profession as a whole. Furthermore, the findings from this project will inform stakeholders, such as accreditation bodies and professional associations, of best practice standards for chiropractic clinical education and will improve the provision of chiropractic clinical education. Understanding how students reach competence and graduate preparedness will reveal valuable insights to inform the design of programs that enhance the chiropractic student clinical experience.

1.11. Study Aim

This study aims to elicit the aspects of a clinical education program that best develop students' clinical practice skills and ascertain what constitutes quality and best practice in clinical education in a chiropractic program, with particular reference to the clinical placement type. The purpose is to gain familiarity and understanding of the literature and theories surrounding best practice in clinical education and learn detailed information from a select chiropractic teaching institution.

1.12. Research Objectives

The overarching aim is to explore the views and perspectives of three distinct stakeholder groups: clinical faculty members (CE and clinical leadership and management [CLM]), students and new graduates of a single American chiropractic institution to answer the study questions. The findings gathered from stakeholder consultation will inform the design of better program services and practices, and approaches to design that can be implemented in the clinical education of chiropractors. The study objectives were to:

- explore and describe elements of best practices in clinical education of chiropractors as reported in the literature;
- identify an institution as an exemplar to conduct a descriptive qualitative approach;
- identify how chiropractic students develop clinical practice skills for professional practice;
- capture the various stakeholders' voices of the specific clinical program of this study as to what constitutes best practice in clinical education;
- identify elements of a best practice model for clinical education in chiropractic programs.

1.13. Research Questions

By reviewing the literature, key questions were identified in relation to the identified exemplar American chiropractic program:

- Do students experience a broad and diverse patient population and case mix and through the diverse settings across on-campus, community, hospital and U.S. Department of Veterans Affairs settings (Dunn, 2006; Till & Till, 2000; Walker, 2016; Wyatt et al, 2005) and what are their perceptions of this experience?
- Hospital settings are considered an ideal CLE, with a higher likelihood for students to see real patient conditions and pathologies (Humphreys & Peterson, 2016; Till & Till, 2000; Walker, 1998; Walker, 2016) and for IPL and IPP experiences (Humphreys & Peterson, 2016; Kopansky-Giles et al., 2007; Walker, 2016). This setting provides more realistic and authentic patient encounters than the traditional chiropractic teaching clinics customary to chiropractic programs (Humphreys & Peterson, 2016; Murphy et al., 2008; Wyatt et al., 2005). What are the perceptions of students clinical experiences within the hospital setting?

What is unknown about the participating institution is:

- the students' lived experiences of the type of clinical placements and settings—on campus or institution clinic, community clinic, hospital and remote competitive internship;
- what setting(s) best ensure the intern is exposed to a rich and diverse educational experience and varied patient case mix;
- what setting(s) best ensure the intern is exposed to authentic patient experience and SLE;
- the extent of IPE and IPP experience, and the strengths and weaknesses associated with this experience; and
- the purpose of a scaffolded approach to clinical experiences and students' supervision.

Thus, the research questions were:

- What aspects of the clinical education program do students/new graduates and clinical faculty members value most?
- What aspects of the clinical education program do students/new graduates and clinical faculty members value least?
- What do students/new graduates and clinical faculty members perceive to be best practice in the clinical education of chiropractors to develop students' clinical practice skills to be practice-ready?

1.14. Scope of the Study

The study explored the clinical education in an American chiropractic institution in the period of data collection, from 15 March 2013 to 27 May 2015. This American chiropractic institution has been a provider of chiropractic education for 100 years and

includes faculty-based hospital appointments in multiple settings. The hospital clinical placement is a part of the clinical program.

The study explored the perspectives of three key stakeholders: clinical faculty, students and recent graduates who had experienced the pre-professional clinical educational program of the chiropractic institution. Stakeholders' perspectives were sought on the best practices in chiropractic clinical education to ensure graduates attain the required standards of competence.

Thus, for practical reasons, the study focused on exploring front line participants' events and perspectives during one moment in time. References to Australian chiropractic education are for general interest. They show comparisons and key points relevant to the landscape of chiropractic education in Australia, where the researcher is a registered practitioner and educator.

Beyond the scope of this project was the collection of perspectives of other teaching faculty and students from the earlier trimesters of the program. Other key stakeholders, such as employers of program graduates and patients who attend the CLE for their care, could provide additional perspectives, but were not included in this study. Furthermore, appraisals, such as accreditation reports and self-evaluation reports, were not included in the study scope as they were not made available.

1.15. Methods

A six-phase, exploratory descriptive design was employed for this qualitative study. This methodology is considered appropriate for investigating issues where there is little current theoretical or factual information about the phenomena and where data are too complex to be captured using other methods (Patton, 2002b; Maxwell, 2005).

Qualitative thematic analysis was applied to the three sets of data collected. Thematic analysis is considered a flexible research tool that provides a rich, detailed and complex

account of the data (Braun & Clarke, 2006). Inductive thematic analysis was utilised, as no previous studies of chiropractic clinical education are dealing with the phenomenon, so the coded categories have been derived directly from the study data (Hsieh & Shannon, 2005).

1.16. Overview of the Thesis

This thesis has been arranged into eight chapters. Chapter 1 introduces the research topic by providing a brief overview of the study context, aims, objectives, significance and rationale. A brief description of the methods of investigation and the setting for this research was also provided. Concluding this first chapter is an overview of the thesis.

Chapter 2 presents the literature review. The detailed justification and rationale for this research is provided in this chapter.

Chapter 3 presents the methodology and explains the choice of methods utilised to collect data. This chapter outlines the qualitative methodological approach and discusses issues relevant to this particular study and the chosen theoretical frameworks. The steps undertaken are described, including the recruitment process, sample size and selection, data collection, analysis, research rigour and ethical considerations.

Chapters 4, 5 and 6 present the analysis of the data obtained from the study participants during semi-structured interviews and focus group sessions. The data are presented in themes, subthemes and subcategories.

Chapter 7 presents the discussion of the key themes identified across the three data sets. The triangulated data are presented as an accumulation of key concepts and theories relevant to best practice in the clinical education of chiropractors.

Chapter 8 presents the conclusions from the research, as well as the strengths, weakness and limitations, and areas for further research. Recommendations based on the identified elements of best practice are provided for chiropractic programs to consider for their clinical education programs. This information is expected to be used as a guide when

informing key stakeholders, such as accrediting bodies, professional associations and other affiliations relevant to chiropractic clinical education, about elements of best practices in the clinical education of chiropractors.

1.17. Conclusion

There is a considerable lack of knowledge in the literature relating to best practice in chiropractic clinical education, hence the necessity for this research. This is shown in Chapter 2, which presents a narrative review of the available chiropractic literature that directly addresses the research question of the review of the literature.

This introductory chapter provided an overview of the research problem, the aim of the research, the objectives and research questions, the methodology and methods, and the significance of the study. The chapter also presented the rationale for adopting social learning theory, ELT, SLT and ALT as frameworks to inform and guide this research.

Chapter 2. Literature Review: What Do We Know About Chiropractic Clinical Education?

2.1. Introduction

Chapter 1 provided the context to the study, including the background, theoretical frameworks, research aims, objectives, research questions, scope, and the justifications and significance of the study. The preceding chapter described the chiropractic clinical education and learning context in which this study occurred, from both local and international perspectives.

The purpose of this chapter is to present the first phase of a six-phase study: the narrative review of the chiropractic clinical education literature. This review identified best practices in clinical education and learning that prepare new graduates with the clinical and professional skills they need. The review provides the context for the thesis and identified gaps in the literature.

From a broader perspective, health professionals' education is distinguished by their exposure to real-life practice through fieldwork education (McAllister et al., 2010). Clinical education is recognised as learning practical skills and professional skills, and socialisation through fieldwork. Through their engagement in various clinical settings, students develop their professional identity, clinical reasoning and management skills in addition to becoming prepared for the complexities of real-world clinical practice settings (McAllister et al., 2010). There are numerous clinical education goals for clinical competencies relevant to the student's discipline, such as clinical-reasoning skills, psychomotor competencies, and interpersonal and communication skills (Higgs, 1992).

Thus, an essential objective of chiropractic education is to cultivate clinical confidence in novice practitioners (Boysen et al., 2016) and foster students' professional

confidence and competence in clinical skills and patient communication (Hecimovich & Volet, 2009). Therefore, chiropractic programs must ensure that their students graduate with the core knowledge and a sufficient skill set to perform their professional obligations (Haworth et al., 2020).

Chiropractic academics have acknowledged that there are limited resources and studies that explore the aims, objectives and best practices of chiropractic clinical education (Ebrall, 2018; Haworth et al., 2020; Mrozek et al. 2006; Puhl et al., 2017). For that reason, chiropractic academics have highlighted the need for chiropractic education and clinical education research (Ebrall, 2018; Mrozek at al., 2006; Puhl et al., 2017). The limited quantitative and qualitative studies available have lacked depth in relation to this study's research questions. There remains a gap in the literature and existing research on the best practices in clinical education in chiropractic (Puhl et al., 2017).

This review represents the synthesis of the most relevant literature, both peer-reviewed publications and non-peer-reviewed 'grey literature'. These were used to identify patterns, themes, similarities, discrepancies and differences in best practice according to previous descriptions of best practice elements in chiropractic clinical education. This chapter presents the relevant and pertinent literature to answer the research question, aims and objectives presented in Chapter 1. The literature presented here mostly consisted of peer-reviewed published articles from the last two decades, from 2000 to 2020. Few earlier citations were included, and only when they were considered seminal work.

2.2. Methods

2.2.1. Narrative Literature Search Strategy

The narrative literature review approach was selected because it provides a comprehensive and critical analysis of the current knowledge on a topic of interest (Baker, 2016). This type of review supplies a broad perspective on a topic when there is little detailed

research and analysis available to justify using a systematic review (Baker, 2016).

Furthermore, this approach was utilised for three reasons:

1. to identify patterns and trends from the literature;
2. to establish a relevant theoretical framework for this research study; and
3. to provide focus and context to the study.

The literature contributing to this review was published between 2000 and 2020.

Exploration of literature across the last 20 years was deemed necessary due to a shortage of published literature in this area. There were few interventional studies, with most published articles being commentaries, debates, opinion pieces with minimal qualitative research. There were very few papers that specifically addressed the research topic.

2.2.2. Search Strategy

During the initial stages of the research investigation, a comprehensive search was conducted using the following databases: Google Scholar, Scopus, MEDLINE, PubMed, ProQuest, Index of Chiropractic Literature, ScienceDirect, ERIC and university library databases of RMIT and Federation Universities. Literature from peer-reviewed journals were included.

Articles were included if they were:

1. published in the previous 20 years (2000–2020 inclusive);
2. written in English;
3. related to the chiropractic discipline; and
4. related to undergraduate education, students, curriculum, clinics and programs.

The exclusion criteria from the available literature were those that included:

1. postgraduate or residency clinical education and programs,
2. clinical intervention research such as clinical and patient outcomes, case studies, case reports, clinical guidelines

3. clinical education articles of other health disciplines and professions (see Appendix A1).

2.2.3. Search Terms

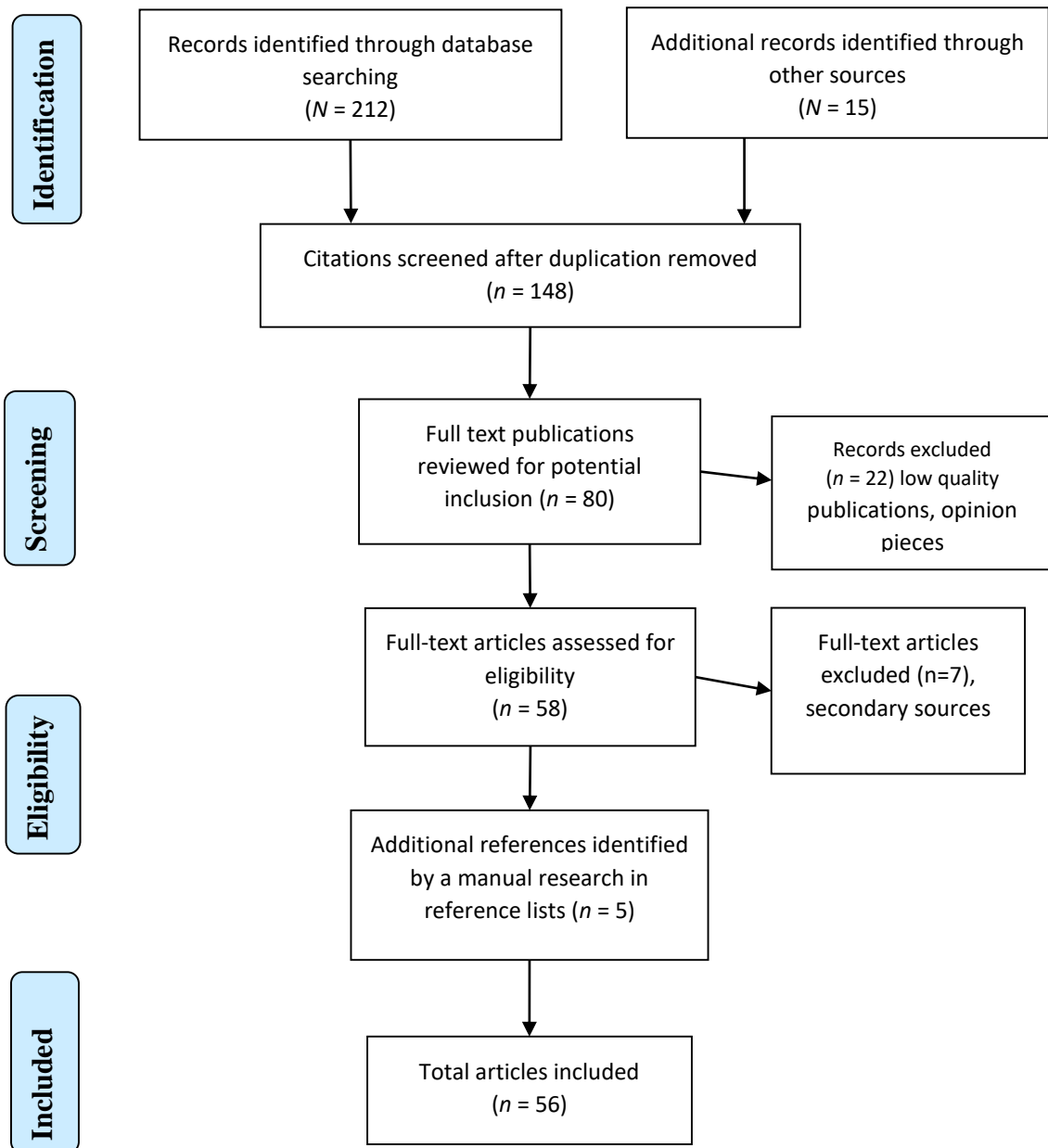
The keywords used were ‘chiropractic’, ‘education’, ‘curriculum’, ‘best practices’, ‘clinical education’, ‘clinical learning’, ‘clinical placement’, ‘clinical learning environment’, ‘interprofessional learning’, ‘interprofessional education’, ‘interprofessional practice’, ‘teaching clinic’, ‘evidence-based practice’, ‘intern’, ‘experiential’, ‘competence’, ‘competency’ and ‘case mix’. The reference lists of journals articles sourced through the search engines were further examined to extract themes, as well as the other suggested articles provided alongside the sought articles. The keyword searches were numerous and needed to be broadened, as the initial searches through Scopus for best practice clinical education and chiropractic revealed no items. These additional terms allowed for the identification of more research articles. The database of Index to Chiropractic Literature was specifically searched to identify studies that were not located through other databases, and revealed five articles. Grey literature was used for other sources, including reports. Publicly available chiropractic accreditation reports from the ECCE were included as evidence of how the clinical components of chiropractic programs were appraised, and as a source of key themes (see Appendix A2).

2.2.4. Study Selection

Through the search strategy and adopting the inclusion and exclusion criteria, 56 articles were included in the review. The study selection is represented in Figure 2.1

Figure 2.1

Flow Chart of the Literature Selection Process for the Narrative Review



The reviewed articles comprised 41 peer reviewed journal articles, and 15 non peer reviewed articles and reports. The eleven major themes that developed from this narrative review of 41 peer reviewed articles are included in Table 2.1.

Table 2.1

Themes from Narrative Review of the Peer-Reviewed Literature

Theme	Source
Research in chiropractic education: Perspectives of Students and New Graduates	Ebrall et al., 2009; Gliedt et al., 2015; Haworth et al., 2020; Humphreys & Peterson, 2016; Institute for Alternative Futures, 2013; Mrozek et al., 2006; Murphy et al., 2008; Puhl et al., 2017; Pulkinnen & de la Ossa, 2019; Walker, 2016; Wyatt et al., 2005.
Being evidence-based	Innes et al., 2016; LeFebvre et al., 2011; Reggars, 2011; Shreeve, 2012; Simpson, 2012; Walker, 2016; Wyatt et al., 2005.
Educating the educator	Ebrall et al., 2008; Murphy et al., 2008; Simpson, 2011; Walker, 2016; Wyatt et al., 2005.
Chiropractic education and industry needs	Ebrall et al., 2009; Ebrall, 2018; Mrozek et al., 2006.

Theme	Source
IPE, IPL and IPP: a fully integrated chiropractic program	Brett et al., 2013; Chung et al., 2009; Humphreys & Peterson, 2016; Kadar et al., 2015; Karim, 2011; Karim & Ross, 2008; Myburgh, 2009; Myburgh et al., 2008; Myburgh & Mouton, 2008; Murphy et al., 2008; Riva et al., 2010; Walker, 2016; Wyatt et al., 2005.
a) A Fully Integrated Chiropractic Program	
Patient/person-centred care	Hammerich et al., 2019.
Prepared for practice	Myburgh & Mouton, 2008; Till & Till, 2000.
Clinical placement and case mix	Amorin-Woods et al., 2019; Boysen et al., 2016; Dunn, 2006, 2007; Holt & Beck, 2005; Humphreys & Peterson, 2016; Kaeser et al., 2014; Kaeser et al., 2016; Kopansky-Giles et al., 2007; Lishchyna & Mior, 2012; Morchhauser et al., 2003; Morgan & Morgan, 2006; Murphy et al., 2008; Puhl et al., 2017; Till & Till, 2000; Todd et al., 2017; Walker, 2016; Wyatt et al., 2005.
a) intensive clinical placement	
Clinical placement and students' clinical development:	Dunn, 2006, 2007; Dunn et al., 2009; Ebrall et al., 2009; Haworth et al., 2020; Humphreys & Peterson, 2016; Johnson et al., 2008; Kopansky-Giles et al., 2007; Murphy et al., 2008; Myburgh, 2009; Myburgh et al., 2008; Myburgh & Mouton, 2008; Puhl et al., 2017; Till & Till, 2000; Walker, 2016; Wyatt et al., 2005.
a) experiential learning in hospital placements	
b) benefits of early experiential learning	
Reflective practice	Ebrall et al., 2009.

Theme	Source
Proposals, reforms and recommendations for chiropractic education <ul style="list-style-type: none"> a) American perspective b) the Australasian perspective 	Ebrall, 2018; Ebrall et al., 2009; Morgan & Morgan, 2006; Murphy et al., 2008; Reggars, 2011; Simpson, 2012; Walker, 2016; Wyatt et al., 2005.
<i>Note.</i> IPE- interprofessional education, IPL- interprofessional learning, IPP- interprofessional practice.	

The chapter concludes with a summary of the 11 identified themes considered important for the study, as shown in Table 2.1.

2.2.5. Charting the Data

A data extraction form was developed to record the author(s), year of publication, study aims, design, sample size and the relevant key findings (study findings, results or outcomes). The relevant studies were tabulated and can be found in Appendix A (Tables A.1 and A.2).

2.2.6. Collating and Summarising the Data

The findings from all 56 included sources were analysed thematically to identify the most common codes relating to the research questions. The findings have been explored and summarised narratively.

2.3. Narrative Review

The review of the 56 key papers is explored and discussed in the narrative review under the following 11 themes and 7 subthemes below.

2.3.1. Chiropractic Education

Chiropractic academics have acknowledged that very few studies have examined chiropractic students' clinical education (Haworth et al., 2020; Humphreys & Peterson, 2016; Mrozek et al., 2006; Puhl et al., 2017). However, they also acknowledge that clinical education is an integral component of chiropractic education (Ebrall et al., 2009; Humphreys & Peterson, 2016; Wyatt et al., 2005).

Mrozek and colleagues (2006) explored research in chiropractic education and recommendations for future chiropractic education-based research. The study aimed to summarise research in chiropractic education by conducting a review of the chiropractic and medical literature from March 1997 to March 2005. They identified several themes in their review, including (a) curriculum, (b) assessment, (c) instructional methods, (d) faculty

development and evaluation, (e) postgraduate and continuing education and (f) patient-centredness. The authors contended that a number of these themes were poorly represented in chiropractic education research over the eight years. Most of the educational research focused on instruction, curriculum, assessment and faculty development (Mrozek et al., 2006). The primary concern surrounding instructional methods was that they were not evidence-based, that chiropractic teaching and education tended to be dominated by tradition and intuition. There was a need to move away from opinion or eminence-based education. Furthermore, Mrozek et al. (2006) made several recommendations for chiropractic curricula, education and development, including:

1. incorporating adult learning principles;
2. developing programs that are more student centred;
3. encouraging students' development of their problem-solving and clinical decision-making skills;
4. supporting students to become lifelong learners who can cope with the extensive information base; and
5. educating students to cope with the changing role of a chiropractor, to meet changing patient expectations and contribute to the healthcare industry (Mrozek et al., 2006).

All themes were relevant to the clinical curriculum and education focused on graduate preparedness. The authors stated that students are the ultimate beneficiaries of research in chiropractic education (Mrozek et al., 2006). Thus, there is a need for review and changes to chiropractic programs to provide contemporary teaching and learning styles for the evolving healthcare industry.

2.3.1.1. Perspectives of Students and New Graduates

While there have been several commentaries from chiropractic academics and leaders regarding the future of chiropractic (Institute for Alternative Futures, 2013; Murphy et al., 2008; Walker, 2016; Wyatt et al., 2005) one study has explored chiropractic students' opinions concerning the future of chiropractic and their perceptions of professional identity and role (Gliedt et al., 2015). The authors acknowledge that students' views on professional identity provide useful insights into the profession's future. They invited 7455 students from 12 North American colleges to participate in a cross-sectional survey, and 1,247 students participated (response rate of 16.7%). Data were analysed using descriptive statistical analysis. The study's key finding was that most participants viewed being educated in EBP favourably (agreed, 34.8%; strongly agreed, 52.2%). The study also found that the main goal of chiropractic interventions was to eliminate vertebral subluxations or complexes (agreed, 35.6%; strongly agreed, 25.8%). Yet, most of the respondents felt that chiropractors should be considered mainstream healthcare practitioners (69.1%). The acceptance of EBP and integration into mainstream health care was perceived in direct contrast to the more traditional theoretical perspective of subluxation-based training and practice. Furthermore, almost half (46.8%) of all participants felt that chiropractic research should focus on the physiological mechanisms of chiropractic adjustments (Gliedt et al., 2015). The authors noted that these findings were contradictory, suggesting respondents' cognitive dissonance (Gliedt et al., 2015). Conflicting ideas seemed to exist whereby students favoured an evidence-based program and mainstream integration of chiropractic, yet also supported more traditional philosophical components in chiropractic programs (Gliedt et al., 2015). However, an interesting outcome was that academics and students hold different perspectives of the profession's future role and identity.

Pulkinnen and de la Ossa (2019) examined the views of European new graduates of chiropractic education, and their development of the skills required for professional practice. While only a pilot study, the study explored chiropractic graduates' perceived preparedness for practice in the seven key competencies according to a standardised tool of the Canadian Medical Education Directives for Specialists. Participants from seven chiropractic programs engaged in the survey, where results showed low scores for competencies related to the roles of collaborator, manager and scholar. Collaborator was defined as "consulting effectively with other doctors and healthcare professional" (Pulkinnen & de la Ossa, 2019 p. 94). Scholar was defined as "contributing to the development of professional and scientific knowledge" and developing their research skills (Pulkinnen & de la Ossa, 2019 p. 95). Manager role was defined as "physicians as integral participants in health care organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the health care system" (Pulkinnen & de la Ossa, 2019 p. 96). In contrast, graduates scored highest in professional and chiropractic expert competencies; they felt prepared as communicators and professionals despite identified gaps in their preparedness (Pulkinnen & de la Ossa, 2019).

The findings from Pulkkinen and de la Ossa (2019) showed there might be a gap between education and professional practice in the three competencies relating to Collaborator, Scholar and Manager. The authors recommend that a curricula review would bridge the gap between education and professional practice, and would improve chiropractic education (Pulkkinen & de la Ossa, 2019).

2.3.2. Being Evidence-Based

Chiropractic courses need to have an underpinning pedagogy that insists that content

is taught in the context of the evidence and that students obtain the necessary training to question and critically appraise. Private colleges and programs such as we see in the USA and other countries do not usually require all staff to produce high-quality research ... It can be argued that this phenomenon is partially the reason for the poor research output legacy from the USA that has left the profession in a parlous state regarding the body of knowledge that underpins what it does and does not do. It is worth reflecting on the increase in knowledge the profession would now enjoy if all chiropractic academic staff worldwide were research active. (Walker, 2016, p. 2)

Walker's (2016) quote is important, and many authors before him had similar views. Earlier in 2012, a literature review exploring how chiropractic colleges incorporate EBP in the curriculum found only three fully developed studies that addressed the research question (Shreeve, 2012). The few available studies reported that the primary focus of EBP education in chiropractic colleges included the first three steps of the EBP process. These three steps include 1) formulating and asking a research question, 2) finding the best available evidence in peer-reviewed literature and other high-quality sources (Johnson, 2008) and 3) appraising the evidence for the validity and applicability of the clinical case being presented (Shreeve, 2012). The missing two steps of the five steps that have not been shown in studies of chiropractic education and utilisation of EBP steps were 4) the implementation of care of patients, among the other elements of patient preference and practitioner expertise and 5) the appraisal of the process (Shreeve, 2012). The perceived issue is that chiropractic students should use all five steps of the EBP process in their clinical encounters to be truly using EBP. Although this may be occurring to some extent, there is a paucity of studies within chiropractic education that depict students' engagement or assess students' communication of research, or that involve patients in shared decision-making in the service-learning environments (Shreeve, 2012). Therefore, the author recommended that chiropractic curricula

incorporate strategies beyond the first three steps and assess how well students perform step four (Shreeve, 2012). There is also a need to reflect on whether chiropractic curricula can be further developed to ensure all five steps are accounted for in curriculum and clinical education (Shreeve, 2012).

Several chiropractic academics from the University of Western States (in the USA) developed a seed document of specific EBP competencies for clinical competencies (LeFebvre et al., 2011). The drivers behind this initiative were the acceptance of chiropractic care by the Veterans Administration and growing interprofessional relations between chiropractic and medicine. This resulted in a curriculum blueprint for teaching particular EBP skills to students and future practitioners, thereby driving an EBP curriculum (LeFebvre et al., 2011). Two guiding principles towards developing the EBP curricula were the following:

1. The skills, knowledge, and attitudes necessary to be a practicing evidence-based doctor should not be learned in isolation, or sporadically in certain courses or journal clubs. It needs to be introduced early and embedded across the curricula before students commence in the clinical phase and;
2. The chiropractic curriculum should help students develop their skills in accessing the literature and critically appraising the quality, generalisability, and application to patients. These skills are required within the professional context and of practitioners. Without these skills as a student, the likelihood the practitioner will abandon this practice. (LeFebvre et al., 2011)

Despite the professional differences, the common ground of evidence-based outcomes and EBP literacy offered the best way to cement a level of cooperation between professions (LeFebvre et al., 2011).

According to Walker (2016), the chiropractic profession should embrace EBP. The adoption of EBP is critical to the future of chiropractic, yet there is resistance by sectors

within the profession (Walker, 2016). Local and international chiropractic academics—such as Wyatt et al. (2005), Simpson (2012) and Reggars (2011)—agree with Walker (2016), and recommend that chiropractic should move away from its historical concepts and philosophies towards a more evidence-based approach.

According to the accreditation standards of the ECCE, all European chiropractic programs are required to provide evidence that the scientific method and other forms of research inquiry and EBP, such as analytical and critical thinking, is being taught (ECCE Commission on Accreditation, 2019). The report on a South African chiropractic program listed a weakness of the program is that it lacked evidence of research in their curricula or clinical practices (ECCE Commission on Accreditation, 2013b). The same accrediting body critiqued several other programs, finding insufficiencies in EBP approaches to patient treatment in their teaching clinics (ECCE Commission on Accreditation, 2014b; ECCE Commission on Accreditation, 2014a; ECCE Commission on Accreditation, 2019a; ECCE Commission on Accreditation, 2013b), despite the delivery of EBP within the curricula (ECCE Commission on Accreditation, 2014b). The ECCE stress the importance of a “longitudinal strategy for embedding EBP delivery from the classroom to the clinic” (ECCE Commission on Accreditation, 2019, p. 4). Recommendations for improving the implementation of EBP in patient care included educating faculty members. After having academic staff undergo professional development in research, the improved research engagement and culture would enhance and expand the existing links between research and teaching (ECCE Commission on Accreditation, 2015).

A study by Innes et al. (2016a) investigated whether EBP was represented across all councils of the CCE Educational Standards. Innes and colleagues conducted a systematic audit to investigate similarities and differences between the standards provided by various councils in the phrasing related to EBP. The results showed that across the four councils, the

word ‘evidence’ appeared 85 times, with nine instances specific to EBP or health care. In contrast, the word ‘research’ appeared 147 times. There seemed to be a level of congruence related to research across the five councils, in that:

programs should train students to be good consumers of research by teaching them how to acquire, appraise and apply evidence within an environment that encourages research. Further, it was commonplace for CCE educational standards to state that students should be trained in research methods and be given the opportunity to become producers of research by conducting research projects. All CCEs expected adherence to high standards of research conduct and ethics. (Innes et al., 2016a, p. 6)

There were differences across the councils in the scope of research and whether it should be discipline specific or not; clinical or teaching and learning; or lead to postgraduate research opportunities for students (Innes et al., 2016a). Accreditation documents for only two of the five chiropractic regulatory bodies—the ECCE and CCEA—contained statements requiring an evidence-based approach be taught throughout the curriculum. Yet, the American regulatory body, the CCE, only mentioned the expectation that students should be introduced to scientific thinking (Innes et al., 2016a).

While there appears to be expectations and objectives for students to engage in and adopt EBP as future practitioners, there is much that needs to be done at the grassroots level of chiropractic education. Educators from within the regular and clinical curricula may need upskilling to ensure that they have the knowledge and abilities in the EBP process and steps. A review of the chiropractic and clinical curricula is needed to ensure that the theory of practice is delivered and implemented. Some inconsistencies between the councils seem to perpetuate the lack of standard delivery and practice of EBP curricula and clinical practice across chiropractic programs (Innes et al., 2016a).

2.3.3. Educating the Educator

Numerous authors have stressed the importance of chiropractic faculty members being skilled in providing evidence-based education (EBE) to ensure EBP in curriculum and clinical practices (Murphy et al., 2008; Simpson, 2012; Walker, 2016; Wyatt et al., 2005). This requires further education beyond a graduate degree for chiropractic teaching faculty. By doing this, fewer unfounded claims were likely to be delivered in chiropractic education (Murphy et al., 2008; Walker, 2016; Wyatt et al., 2005).

Following this theme, Ebrall, Draper and Repka (2008) examined the Royal Melbourne Institute of Technology chiropractic clinical program due to perceived issues within the teaching clinics with an aim towards the improvement of the students' clinical-learning experiences. From an observational investigation of 400 of the student teaching clinics' patient records, the patient diagnoses and management revealed the development of a 'diagnostic reductionism' within patient records. The holistic curricula were not reflected within the patient diagnoses and management plans revealing a gap between curricula and the teaching clinics. They attributed this disconnect to the relations between academics and CE, and the effect was a disparity between the curricula, the CLE and the delivery of patient care. Effectively, the students adopted potentially contradictory principles and methods according to their CE's perceptions and experience. The students' clinical learning was driven by the individual CEs, or the 'N-of-1' (Ebrall, Draper & Repka., 2008). The disconnect and lack of clinician training can result in students experiencing a very different perspective in the final components of their undergraduate program—a crucial time in their clinical and professional development (Ebrall, Draper & Repka, 2008). Therefore, this necessitated a further research project to construct, develop and implement a clinician training program for the CE that integrated the students' curricula content and pedagogy into the clinical components (Ebrall, Draper & Repka, 2008). This demonstrates how the program can be influenced by the

perspective and influence of the CE when there is no formalised training of the educators. Furthermore, assisting CEs to develop their skills as educators when much of their experience is as a practitioner (Ebrall, Draper & Repka, 2008). Due to the effect and influence of CE on the students' clinical-learning experiences, they voiced the importance of educating the educator (Ebrall, Draper & Repka, 2008).

2.3.4. Chiropractic Education and Industry Needs

There have been concerns from several chiropractic scholars that chiropractic curricula and the mandated requirements set by accrediting authorities may not be aligned with the profession and industry needs. Mrozek and colleagues (2006) state that students need to be educated to cope with the changing role of the chiropractor, as patient expectations and the healthcare system also change. More recent publications from Ebrall et al. (2009) and Ebrall (2018) pose the question of how to ensure programs in chiropractic education remain relevant to the society in which they operate, and how the pedagogy of chiropractic programs change to reflect contemporary theories of learning (Ebrall, Draper & Repka, 2008). Of importance is that chiropractic clinical learning must reflect the communities and societies in which the discipline is taught, legislated and practised, as well as be educationally sound (Ebrall, Draper & Repka, 2008). Concerns have also been expressed that outdated accreditation standards were driving clinical programs (Ebrall et al., 2009) and retarding chiropractic program changes and innovations (Ebrall, 2018).

2.3.5. Interprofessional Education, Interprofessional Learning and Interprofessional Practice

The WHO (2010) details the case and need for IPE and collaborative practice in health care. A push towards collaborative practice in the healthcare setting is evident. Historically, chiropractic practitioners have operated autonomously in the professional

context, in a silo type arrangement (Humphreys & Peterson, 2016; Murphy et al., 2008; Myburgh et al., 2008, Riva et al., 2010; Wyatt et al., 2005). This autonomous chiropractic professional is likely a reflection of the chiropractic education and experiential learning within the clinical settings (Karim & Ross, 2008). The problem with single profession experiential learning is that graduates may not be prepared for any clinical context other than as an autonomous professional. This is quite typical of chiropractic, as mandatory interprofessional engagement has not been a part of chiropractic education (Karim, 2011; Karim & Ross, 2008; Riva et al., 2010).

In North America, chiropractic curricula have been delivered in isolation at chiropractic colleges and external to the university system (Karim & Ross, 2008; Murphy et al., 2008; Wyatt et al., 2005). From this type of educational setting, a consequential lack of interprofessional opportunities (Murphy et al., 2008; Myburgh & Mouton, 2008; Walker, 2016; Wyatt et al., 2005). However, being placed within a university setting does not guarantee that students have an interprofessional experience in their clinical training (Haworth et al., 2020).

IPE and IPL within the clinical program were perceived as highly important from a review of all eleven ECCE reports. The accrediting body commended student clinical placements in hospitals for the interprofessional links with other medical sciences (ECCE Commission on Accreditation, 2013a). With chiropractic students working in these integrated health-professional environments, the integrated clinical approaches provided students with exposure to patient-centred models of care (ECCE Commission on Accreditation, 2014b; ECCE Commission on Accreditation, 2013a) and contributed to students' IPP as graduates (ECCE Commission on Accreditation, 2013a). Conversely, there was criticism directed at programs with little or no IPP, such as a "lack of medical input into the outpatient clinic" (ECCE Commission on Accreditation, 2015 p. 7) and limited involvement in the wider

healthcare system through collaborating with other health professions (ECCE Commission on Accreditation, 2015).

Karim (2011) discussed some of the necessary changes to implement for IPE in the chiropractic education sector, following their exploration of the literature and examples from other health professions. Suggested frameworks included developing an interprofessional culture in both the classroom and the CLEs that would extend into the professional sector. The author considers that it is insufficient to place students from various disciplines in a classroom together and believe this would lead to interprofessional relations and an understanding of each of the disciplines' roles, perspectives and contributions. There is a need to explore each profession's roles and to build upon key areas of trust and communication in the educational setting; these are important ingredients in building interdisciplinary teams. These same approaches are needed when students engage in their CLEs (Karim, 2011).

In 2013, an American report of one particular example of interprofessional training for chiropractic students—that is, including their clinical rotations within the Veterans Administration medical centres—was presented (Brett et al., 2013). This rotation and setting have provided a means for students to interact both intra-professionally and inter-professionally with health practitioners in the patients care (Brett et al., 2013). There is a reciprocal benefit of such IPL; interactions increase awareness and appreciation of each discipline and patients receive customised care (Brett et al., 2013). From these interprofessional student experiences, there is an expectation that graduates will be better prepared for graduate IPP (Brett et al., 2013).

For CAM health disciplines, such as chiropractic, there has been a lack of literature related to IPE initiatives compared to allopathic healthcare professions (Kadar et al., 2015). The majority of the reported IPE initiatives even exclude CAM disciplines (Kadar et al.,

2015). Yet educators and students are known to share a concern about the necessity for IPE and interprofessional training needs for chiropractic students (Chung et al., 2009; Karim, 2011).

Chung and colleagues (2009) describe how chiropractic students can drive IPE initiatives. Canadian Memorial Chiropractic College (CMCC), only delivers a chiropractic curriculum and extensions of chiropractic postgraduate certifications. They instituted an Interprofessional Education Council, constituted of students and faculty mentors, and developed the 'Diamond Approach' method to IPE (Chung et al., 2009). Two examples of these educational engagements included a direct and equal student exchange with the University of Toronto School of Medicine, where students spent time in each other's discipline's classrooms and clinical settings. Students from both disciplines provided complimentary feedback about the value of the experience, recommending that all healthcare students have the opportunity to participate. This smaller, student-driven initiative led to an expansion in the nature and number of interprofessional opportunities between CMCC and other academic programs (Chung et al., 2009).

More recently, the faculty of a North American institution developed a task force to create IPE initiatives among chiropractic and acupuncture and oriental medicine disciplines co-located on the same campus (Kadar et al., 2015). Driven by the university's strategic plan to improve IPE within the institution and with other healthcare institutions, a survey was conducted to determine the existing perceptions of IPE and IPP, and identify areas of concern before formulating recommendations (Kadar et al., 2015). Survey questions were grouped around three themes: (a) attitudes towards IPE within the home institution, (b) attitudes towards generalised IPE and (c) attitudes towards IPP. Results showed that alumni had more favourable attitudes than students towards IPP. The student response was believed to reflect a lack of understanding or experience with IPP compared to alumni and faculty. The majority

of responses reflected a positive attitude towards IPE; however, acupuncture and oriental medicine students revealed less favourable perceptions of IPE and IPP. Most importantly, to improve the students' perceptions of IPP, educational interventions need to be designed in a way that reassures students that their professional identity will not be affected (Kadar et al., 2015). One critical aspect of IPE and IPP was revealed in this study: the importance of acquiring and maintaining professional identity. The adoption of these initiatives is not so simple, even when two different health disciplines co-exist on campus. This also illustrates how a limitation in formalised IPE in the learning environment can potentiate professional barriers and minimisation of practice in the clinical setting. Yet through shared educational pathways, such as the two taskforce initiatives of chiropractic with other health professions (Chung et al., 2009; Kadar et al., 2015), there is a perception that Doctor of Chiropractic programs (DCP) have increased chiropractors' integration into the healthcare system as a whole (Institute for Alternative Futures, 2013).

Another aspect of integration was addressed in Walker's (2016) commentary, where he was critical of students being taught only by chiropractors. He recommends that faculty be multidisciplinary, with medical doctors, physiotherapists and other allied health personnel involved in chiropractic programs and education. This is because "simply put, teachers of chiropractic students should be the most skilled and experienced in the content area involved" (Walker, 2016, p. 3). Irrespective of who teaches in chiropractic programs, it is critical that programs are integrated.

2.3.5.1. A Fully Integrated Chiropractic Program

A fully integrated program means that the chiropractic program has been developed in consultation with the discipline of medicine to include shared teaching, faculty and curricula as well as interprofessional clinical practice during the clinical clerkship and internship (Humphreys & Peterson, 2016). In recent times, Humphreys and Peterson (2016) provided a

detailed report of the Swiss chiropractic program as an example of a fully integrated program with medicine at the University of Zurich. The program shares the teaching of common subjects, faculty, experiential learning activities and clinical placements with the discipline of medicine. Students have access to journal clubs and grand rounds with specialty medical disciplines to increase their clinical knowledge and skills (Humphreys & Peterson, 2016).

The perceived advantages of this integrated program within a university setting with hospital access is that both students and staff are the beneficiaries of quality academics, researchers, resources and facilities. Students' access to patients across the two types of clinical learning settings has surpassed the usual constraints of the chiropractic clinical-learning experiences in other programs, where the "patient contact has traditionally been a deficiency of chiropractic education worldwide" (Humphreys & Peterson, 2016, p. 59). Due to the ongoing interprofessional engagement, challenges of integrating within the hospital setting have been overcome. Students having experiences with complex patients during their studies will ensure graduates are well placed in the professional setting. All these factors are considered to advance chiropractic education and practice. However, due to the small cohort of chiropractic students compared with medical students, concern has been raised about chiropractic students' development of professional identity (Humphreys & Peterson, 2016).

Moreover, a commentary from academics involved with the Danish chiropractic program explored the profession's secondary legitimacy, due partly to the chiropractic program being positioned in the university setting alongside medicine with hospital clinical placements (Myburgh et al., 2008; Myburgh & Mouton, 2008). This may be "the first example of the chiropractic profession being accepted into mainstream health care as an equal partner" (Myburgh et al., 2008, p. 395). The Danish public university-based program included chiropractic in an IPE setting with health faculty in a medical school. This co-location has allowed for a major overlap and integration of teaching between the two

professions of chiropractic and medicine. The student' clinical placements and experiential learning occur among the medical profession in the university hospital during the undergraduate program, and in specialty public sector clinics during the postgraduate phase. This experiential training model has provided students with exposure to managing complex and problematic patient cases rather than what would be considered everyday practice scenarios (Myburgh & Mouton, 2008). Because of these factors, it has been purported that "chiropractors learn how the broader healthcare system functions and gives access to patients previously off-limits" to chiropractors (Myburgh et al., 2008, p. 394). This has resulted in interprofessional experiences and communication between chiropractic students and faculty, and positions chiropractic to become a member of the healthcare team (Myburgh et al., 2008).

Several academics from two recently developed, European university chiropractic programs that are integrated with medicine perceive overall support for a fully integrated model (Humphreys & Peterson, 2016; Myburgh et al., 2008; Myburgh & Mouton, 2008). The perception is that the benefits far outweigh the costs in terms of quality of the program, clinical education and professional profile (Humphreys & Peterson, 2016; Myburgh et al., 2008). They have tried to address students' development and concerns of professional identity when immersed among medicine students (Humphreys & Peterson, 2016; Myburgh & Mouton, 2008). Those important issues aside, the most significant aspect of clinical education is that chiropractic students learn to be patient-centred. It would appear that the legislation of the chiropractic profession and culture of these particular European countries has allowed for this type of professional integration amongst other health professions, particularly medicine. This interprofessional engagement and acceptance is not customary of all countries and regions where chiropractic is a registered profession or practiced (Allareddy et al., 2007; Langworthy & Birkelid, 2001; Salsbury et al., 2018).

2.3.6. Patient-Centred and Person-Centred Care

There is no globally accepted definition of patient-centred care (International Alliance of Patients' Organizations, 2007). According to the International Alliance of Patients' Organizations (2007), for both the health-professional and the patient, patient centred care is based on mutual trust, communication and partnerships within the healthcare system. Americans define patient-centred care as care that is respectful of and responsive to individual patient preferences, needs and values, while ensuring that patient values guide all clinical decisions (IOM, 2001). The Australian Commission on Safety and Quality in Health Care (2011) claim that patient-centred care improves the patient satisfaction and experience, quality and safety of health care and positively affect business metrics. The key elements of person-centred care include access to care, respect, emotional support, physical comfort, information sharing, clear communication, continuity of care with appropriate transition and care coordination, and involvement of significant others (Australian Commission on Safety and Quality in Health Care, 2011). Among the 22 system-oriented recommendations of the Australian Commission on Safety and Quality in Health Care is the sixth and seventh recommendations that patient-centred care should be a component of education for health programs, and that "education programs should engage patients and families as teachers and collaborators, rather than solely as cases to be studied" (Australian Commission on Safety and Quality in Health, 2011 p.2).

A review of the European chiropractic program accreditation reports revealed criticisms of those that did not follow a person-centred approach to patient care in their teaching clinics (ECCE Commission on Accreditation, 2014a). Furthermore, the clinical initiatives did not reflect a model of biopsychosocial, patient-centred care, and lacked interaction with other health professions (ECCE Commission on Accreditation, 2014a).

In recent years, chiropractic academics have explored chiropractic students' attitude towards patient-centred care through a multiprogram survey (Hammerich et al., 2019). Hammerich and colleagues included 1858 respondents from seven select chiropractic programs worldwide (Hammerich et al., 2019). The authors acknowledged that little was known about how chiropractic educational programs teach and assess student attitudes towards patient-centred care. Being further informed about teaching and assessment could facilitate clinical and academic training and competencies to ensure that there was a provision for patient-centred care (Hammerich et al., 2019).

Through the utilisation of a standardised survey tool, the Patient–Practitioner Orientation Scale, Hammerich and colleagues (2019) explored students' patient-centred attitudes towards the doctor–patient relationship. One Australian, three North American and four European chiropractic programs participated in the research. Data were analysed descriptively and inferentially for the sharing and caring subscales. There were small but significantly different scores between chiropractic programs worldwide, and scores tended to be lower than those reported among medical students. The authors induced that chiropractic students' attitudes *tended* towards a patient-centred approach to care delivery across international chiropractic programs (Hammerich et al., 2019). The scores increased with increasing student age and were higher, on average, for females. The lower score among chiropractic students might be dependent upon curricular content or may be attributable to the timing or nature of their exposure to patients towards the end of the program (Hammerich et al., 2019). This study was not conclusive but could indicate a need for more person-centred approaches and initiatives in experiential learning. CE who utilised these approaches in the clinical setting allow students to model these behaviours, through social and situated learning (Hammerich et al., 2019), as they prepare for professional practice.

2.3.7. Prepared for Practice

Preparing students for professional practice via placements is a topical issue in Australia (Smith et al., 2019). In Australia and other countries, such as the USA, the focus of the chiropractic curricula can enhance or limit students' development of the necessary competencies and capabilities for diagnosis, assessment, therapeutic interventions and patient management. Another important factor relates to students' professional business skills, such as running a small business, and entrepreneurial skills. A recent accreditation report on the McTimoney College of Chiropractic (ECCE Commission on Accreditation, 2019b) included provisions in the curriculum for business and marketing education to assist graduates in starting a practice, in addition to regulatory and ethical requirements. The accreditation report recommended that the college better "prepare students for professional life beyond its walls". It was aware that many graduates start practice on their own immediately, and therefore require the basic skills of business and marketing" (ECCE Commission on Accreditation, 2019 b, p. 22).

Historically, there has been a trend that chiropractic students have not been well prepared for running their practice (Pulkinnen & de la Ossa, 2019, Sikorski et al., 2021). However, colleges are making changes in integrating more business education into the students' training (Institute for Alternative Futures, 2013). Other concerns include whether the student exposure to patient case mix and the quality of the experiences during the clinical externship reflect professional experiences (Till & Till, 2000). An overarching concern has been whether the clinical experience for the average chiropractic program and clinical placement adequately prepare chiropractic graduates to function as primary contact and primary healthcare practitioners and whether they are sufficiently confident to enter private practice (Till & Till, 2000). Some chiropractic academics believe the answer to these questions relate to students' preparedness is no (Till & Till, 2000). They see that the solution

to many of these critiques, inadequacies and drawbacks of the chiropractic clinical experience would be to mimic the medical student experience. In the practice environment of Till & Till (2000), this would include access to the public hospitals and clinics of South Africa. The benefits of a hospital placement would include increased access to patients and access to a varied patient case mix, with a greater variety of pathologies and psychosocial circumstances than what is typically found in chiropractic teaching clinics (Till & Till, 2000). Chiropractic students' clinical learning within a hospital setting could significantly expand the future chiropractors' clinical preparedness (Till & Till, 2000).

While there are many benefits of hospital placements that allow students to develop their clinical skills through experiential learning with complex patient populations, there are certain aspects where students may be disadvantaged (Myburgh & Mouton, 2008). In hospital settings, students do not learn the critical aspects of what it takes to run a practice, especially when it comes to patients attending a private practice. From their hospital experience, the student and new graduate believe that they will just go in there and be busy (Myburgh & Mouton, 2008). The Danish program's experiential training has developed a graduate chiropractor competent to manage complex patients in a public health system; however, these chiropractors are not as well equipped to manage the private patient. Their students tend to lack practice management skills (Myburgh & Mouton, 2008), which is problematic when that is the likelihood of their graduate practice. Furthermore, they will come in contact with a wide variety of patient types and case mix.

2.3.8. Clinical Placements and Case Mix

One objective of chiropractic educational programs is to ensure that students will graduate with a core knowledge and skill set to meet their professional obligations as a primary contact healthcare professional (Puhl et al., 2017). Morschhauser et al. (2003) stated

that “different types of teaching clinics may facilitate greater diversity in the patient population seen by chiropractic students, broadening the clinical training of chiropractic students by providing diversity in clinical settings and patient populations” (p. 70). Hence, the clinical program and internships need to be designed to provide a diversity of patients that reflects private clinical practice (Puhl et al., 2017).

There have been perceived insufficiencies in chiropractors’ requirements of clinical education, specifically, the limited clinical exposures provided to students in the chiropractic programs (Murphy et al., 2008; Wyatt et al., 2005). It has been claimed for over 15 years that institution-based teaching clinics have been the mainstay of chiropractic CLEs (Wyatt et al., 2005). These clinical settings are perceived as least representative of real-world clinical settings; reasons for this include that the flow of clinical processes, from patient examination to treatments, are filled with interruptions and the necessity for approvals that prevent the student from tending to patients in a fluid manner. These student and supervising doctor requirements produces a protracted patient care experience (Boysen et al., 2016). Furthermore, there is a perception the patient case mix and real patients seen by chiropractic students are limited, and the patient experience is not reflective of that expected after graduation (Till & Till, 2000; Wyatt et al., 2005).

The ECCE often commended chiropractic programs that provided varied student clinical placements (ECCE Commission on Accreditation, 2019b; ECCE Commission on Accreditation, 2016; ECCE Commission on Accreditation, 2013a; ECCE Commission on Accreditation, 2012). In comparison, critiques included limited clinical placements facilities and external sites, and minimal links with other healthcare providers (ECCE Commission on Accreditation, 2015). A clear preference that students’ clinical placements are not restricted to only one clinical placement for their SLE, such as the institution-based clinics (ECCE Commission on Accreditation, 2015; ECCE Commission on Accreditation, 2019a; ECCE

Commission on Accreditation, 2013a). The accreditation report for the University of Southern Denmark (ECCE Commission on Accreditation, 2013a) appraised the program for providing diverse clinical placement settings, from chiropractic offices to the university hospital and specialty outpatient centres; the university was referred to as having an “enviable position” for the clinical education of their students (ECCE Commission on Accreditation, 2013a p. 24). The French program at Institut Franco-Europeen De Chiropraxie also includes a multitude of clinical placements in their institution teaching clinics, in hospital and in private practices (ECCE Commission on Accreditation, 2019a). The ECCE conclude that students gain the necessary clinical and communication skills and ethical values to assume clinical responsibility from these varied clinical experiences. Their clinical training is deemed sufficient to become an independent chiropractor and achieve specified competencies upon graduation (ECCE Commission on Accreditation, 2019a).

However, from the American perspective, chiropractic scholars have expressed concern that a significant void exists in the chiropractic clinical programs as to how “chiropractic graduates develop any meaningful hands-on clinical experience with real patients in real-life situations” (Murphy et al., 2008, p. 5). Research that examines the types of patients who attend the various settings and locations of teaching clinics has been conducted over concern for students’ exposure to patient case mix (Lishchyna & Mior, 2012; Morschhauser et al. 2003; Puhl et al., 2017). Several studies have explored the chiropractic clinical placement types and patient case mix, making comparisons between professional practice profiles and students’ competence. These studies have included chiropractic programs from several North American institutions (Kaeser et al., 2014; Lishchyna & Mior, 2012; Morschhauser et al. 2003; Puhl et al., 2017;) and a New Zealand chiropractic program (Holt & Beck, 2005). Foremost, the clinic location has been influential in attracting patients of varying socioeconomic characteristics (Lishchyna & Mior, 2012). The reasons for

exploring the types and quality of clinical placements—whether community, institution-based or hospital—seems mostly related to the characteristics and demographics of patients who attend these settings (Kaeser et al., 2014; Lischhyna & Mior, 2012; Morschhauser et al., 2003). The importance of student access to a varied patient case mix (Holt & Beck, 2005; Kaeser et al., 2014; Lischhyna & Mior, 2012; Morschhauser et al., 2003; Puhl et al., 2017;) and clinical placements that reflect ‘real-life’ experience based on the similarity of the patient case mix in comparison to the professional characteristics have been explored and measured (Holt & Beck, 2005; Lishchyna & Mior, 2012; Puhl et al., 2017). The concern is that the chiropractic SLEs may not be providing adequate experiences and patient types for students to develop the required skills for professional setting (Lischhyna & Mior, 2012; Murphy et al., 2008; Puhl et al. 2017; Wyatt et al., 2005).

The effect of the type of clinical placement and CLEs for chiropractic students is illustrated in the following quotation:

An important outcome of a chiropractic clinical internship program is to ensure graduates are proficient diagnosticians and experts in (the) therapeutic management of patients with neuromusculoskeletal conditions. In part, this is achieved by providing educational experiences designed to simulate ‘real-life’ clinical practice. Thus, the intern’s clinical experience becomes the driving force for new and higher-order learning. (Lishchyna & Mior, 2012, p. 161)

The quality of the CLE, experiences and types of patients seen are paramount to the students’ acquisition of the necessary clinical and professional skills. What has already been explored is the representative case mix within the chiropractic teaching clinics, as these settings traditionally provide a narrow patient case mix (Holt & Beck, 2005; Humphreys & Peterson, 2016; Morgan & Morgan, 2006; Morschhauser et al., 2003; Murphy et al., 2008; Wyatt et al., 2005) that is not reflective of clinical experience in the professional context

(Holt & Beck, 2005; Morschhauser et al., 2003; Wyatt et al., 2005). This seems to be an ongoing concern among chiropractic academics, who have posed the question:

“Do the variety and severity of conditions seen by chiropractic students in their 1 year of clinical experience, reasonably compare with what they can expect to encounter in private practice?” (Till & Till, 2000, p. 131)

The very young and geriatric age groups are commonly under-represented in chiropractic teaching clinics (Beck & Holt, 2005; Kaeser et al., 2014; Puhl et al., 2017; Todd et al., 2017). Yet, there is a need to prepare students to see both paediatric and geriatric patients in the CLE (Beck & Holt, 2005). There are concerns and concerted efforts to explore and improve upon the clinical programs and types of clinical placements offered to students within the North American programs (Dunn, 2006, 2007; Kaeser et al., 2016; Kopansky-Giles et al., 2007; Morschhauser et al., 2003; Murphy et al., 2008; Puhl et al., 2017; Wyatt et al., 2005).

Several articles have addressed the quality of clinical opportunities provided through chiropractic internships, with comparisons drawn between institution-based clinics and the hospital setting placements (Humphreys & Peterson, 2016; Kopansky-Giles et al., 2007; Murphy et al., 2008; Till & Till, 2000; Wyatt et al., 2005). There are currently no Australian chiropractic programs that provide clinical placements within the hospital setting (Walker, 2016), which creates a significant difference in the type and quality of clinical-learning experiences between programs offered in Australia and those offered internationally.

There is a lack of recent data on the case mix of patients seen within Australian chiropractic program teaching clinics. The only Australian study available was published in 1992 by Walsh; this study was excluded as it was considered outdated research. A study from the New Zealand College of Chiropractic collected the basic characteristics of new chiropractic patients presenting to their institution teaching clinic. This retrospective study

examined the patient demographics and clinical presentation of 1004 patients over four years. They found similarities with patient demographics of student teaching clinics' in the USA and Australia; however, some discrepancies were noted between the patient characteristics at the teaching clinic and the general New Zealand population (Holt & Beck, 2005).

From the United States context, a 2014 study at Logan College of Chiropractic compared the demographics and chief complaints of the new patient population at their four fee-for-service clinical-teaching facilities with those from the Practice Analysis of Chiropractic 2010 survey (Kaeser et al., 2014). Prevalence of common comorbidities, such as obesity and hypertension, was also compared against the adult population reference standards. Comparisons showed that the Logan clinic patients differed from patients in the Practice Analysis of Chiropractic 2010 data obtained from USA chiropractors (Kaeser et al., 2014). The demographic and clinical characteristics of new patients at their teaching clinics were dissimilar to those who present at chiropractic practices in the USA (Kaeser et al., 2014). The Logan clinics also saw fewer very young patients compared to practice analysis (0–5 years, 1.8% v. 7.7%) and fewer older patients (51–65, 25.5% v. 38.2%). They reported a lower prevalence of common comorbidities such as obesity (29%) compared to the general USA population (35.7%), and a much lower prevalence of hypertension (8% v. 33%) (Kaeser et al., 2014). The authors stated that they intentionally engaged in this study to identify the gaps that may need to be filled to provide interns with a wide variety of clinical opportunities that may supplement the profession's likely patient demographic (Kaeser et al., 2014). Kaeser and colleagues highlighted the importance of monitoring the patient demographics of their teaching clinics to ensure that they could provide chiropractic interns with an adequate diversity of experience to be well prepared for practice (Kaeser et al., 2014). As the clinical settings studied were all fee-for-service clinics, studying the patient profile populations of

community settings might reveal different patient demographics, differences of comorbidities, that may reveal similarities to that of professional practice patient profile.

Other studies that explored the patient case mix in chiropractic teaching clinics have come from Canada (Lishchyna & Mior, 2012; Puhl et al., 2017). Lishchyna and Mior (2012) compared the patient populations attending chiropractic private practices to patient populations at one of the CMCC's community-based chiropractic student teaching clinics in Ontario. In this retrospective cross-sectional study, an analysis was conducted of the patient demographics and presenting complaints from all new patient clinical records over approximately two years. In total, 580 files met the inclusion criteria. The findings showed that the general demographic and clinical characteristics of new patients at this teaching clinic were similar to those who attended the private practices of chiropractors within the state of Ontario. Like field practitioners in private practice, the chiropractic interns at this clinic did not have much exposure to the paediatric population. However, due to the placement of the clinic within close proximity to seniors' residences, there was an adequate representation of 'retired status' patients. While the data presented only a moment in time, the authors were able to conclude that this particular clinic's patient profile appeared similar to practising chiropractors in Ontario (Lishchyna & Mior, 2012). Differences between the student clinics and practitioner practice patient profiles, included the severity of conditions, which may affect the training experiences of students. The case mix of this specific community-based teaching clinic provided students with appropriate learning opportunities to achieve competencies necessary for practice (Lishchyna & Mior, 2012).

Another, more recent, study from CMCC explored the patient case mix experienced by chiropractic students as part of a clinical internship (Puhl et al., 2017). In this study, researchers examined data from various CLEs, not just a singular clinical setting. Similarly, they identified and characterised similarities between the teaching clinic patient populations

and published data for practising chiropractors in Canada. The teaching clinics included the college campus clinic, three community health settings and two hospital settings. Not included in this study was the specialty paediatric clinical setting. Data collected by surveying a convenience sample of 24 students; which generated from their records data on 828 patients, a total of 948 unique complaint presentations via new patients' presenting with new complaints over one year. The results revealed a case mix with a higher proportion of females (60%). The vast majority (86%) were within the adult age group of 18–64 years; very few paediatric patients presented to the teaching clinics. The majority (93%) presented with pain-based complaints, 67% were chronic complaints, 65% included spinal complaints and 7% presented with red flags. On average, treatment recommendations called for 9.4 visits and often included multimodal treatment approaches involving soft tissue therapy (91%), home-based care (84%) and spinal manipulative therapy (70%). What could be concluded by this study was that the presenting conditions and profiles of new patients at this chiropractic program were similar to previously published reports of patients that attend private clinics (Puhl et al., 2017). Importantly, the students had opportunities to encounter patients that likely reflected the professional context. What could also be observed was that the various networks of CLEs, in the community and hospital settings, may provide the case mix that is representative of the private practice setting, thereby adequately preparing graduates for the professional context. Furthermore, students of this program were experiencing case mixes that included complex cases (Puhl et al., 2017).

Earlier, Kopansky-Giles and colleagues (2007) provided a commentary on the SLEs across the various CMCC clinical placement settings in the Greater Toronto area. SLEs include community and hospital-based clinical placements as a part of their graduate and postgraduate chiropractic clinical programs (Kopansky-Giles et al., 2007). The authors stated that these placements offer a real-world clinical engagement, a variety of case mix and

patient presentations, and the opportunity to operate within an integrative and collaborative clinical setting (Kopansky-Giles et al., 2007). The perceived benefits of chiropractic within the hospital clinic included reduced barriers for patient access to chiropractic care, enhanced quality of health care through interdisciplinary practice model, high referral rates from other practitioners, collaborative practice among health disciplines and an evidence-based setting (Kopansky-Giles et al., 2007). The collaboration among the various health professions provided patient-centred care with good patient satisfaction and clinical outcomes (Kopansky-Giles et al., 2007). The varied clinical placements in community and hospital settings provided numerous benefits to both students and the patients they serve. By offering these varied clinical student placements, the patient populations being served provide good exposure for students for their clinical knowledge, professionalism, community awareness, and students have the opportunity to become a better practitioner (Kopansky-Giles et al., 2007).

2.3.8.1. Intensive Clinical Placements

In this context, the term ‘intensive’ means a concentrated or condensed experience that has been conducted over a short time period. The idea is to build students confidence and skills through immersion and repetition of their clinical interactions with authentic patients (Amorin-Woods et al., 2019; Boysen et al., 2016; Todd et al., 2017). In the last decade, several chiropractic programs have appraised their extension of clinical programs, which immerse students in overseas or regional intensive clinical placements that see a high patient caseload from communities with limited access to health care (Amorin-Woods et al., 2019; Boysen et al., 2016; Todd et al., 2017). One American chiropractic program explored the educational experiences of 17 students who participated in a short-term international clinical placement in either Fiji, Honduras or India (Boysen et al., 2016). This qualitative study

evaluated the effect of the clinical placement on students' clinical confidence. Students were asked about their clinical confidence, but no measurements or assessments were utilised to compare their competence and skills. The limitation that students may have is a sense of confidence in procedures, but not competence. A number of professional and clinical exposures benefited the students, particularly their professional preparedness, by transforming an "unsure student to a confident doctor" (Boysen et al., 2016, p. 124). The factors attributed to this transformation were:

1. treating patients in a realistic setting;
2. repeating technical skills frequently;
3. practising clinical decision-making; and
4. communicating with patients as well as other professionals.

Participants described increased clinical confidence across nine competency areas that related to clinical, technical and professional domains. In addition to the effects on their skills, participants saw this additional clinical opportunity as a chance to attain the real-world exposure that may inform their future practice setting—such as in a hospital or interprofessional setting—and area of focus, such as paediatrics (Boysen et al., 2016). The benefits for professional preparedness were obvious and were not limited to just the clinical aspects. The objectives of providing these experiences close to the time when students are completing their chiropractic program seem to aid the transition from student to practitioner (Boysen et al., 2016).

Locally, a mixed method study of 64 students enrolled in an Australian undergraduate chiropractic program at Murdoch University explored the influence of non-metropolitan clinical immersion placements (CIPs) on the student experience, professional attributes and their practice destination (Amorin-Woods et al., 2019). Inclusion criteria were students from the period 2011–2015 who went on these CIPs, and no comparisons were made with those on

regular clinical placements. Participants completed a questionnaire and reflective feedback form following their SLE in a non-metropolitan CIP. The second phase of the study explored the participants' graduate practice location through online searches of the national chiropractic registration data. The participant responses showed a 98% positive rating for the Service Experience Questionnaire, reporting that it was an educational experience that should be retained and these placements should be more frequent. The placement duration of two weeks seemed to be suitable.

The study also found that there was a positive change in attitudes towards rural health care and the chiropractic profession's role in rural communities. Most importantly, some professional attributes were influenced by this CIP, such as improving their communication, time management, respect for others and empathy for the disadvantaged. Clinically, it positively affected their diagnostic and therapeutic skills. When comparisons were made between the campus-based clinic and the non-metropolitan CIP, the latter provided a more diverse case mix, a larger volume of patients and greater development of clinical skills—both diagnostic and therapeutic. Because of the CIP experience, 75% of the participants indicated they would be more likely to practice in a country setting. However, this was not fully reflected in the profile location of their graduates' professional placements. Despite this, the authors stated that “the study was the first to investigate the possible influence of nonmetropolitan CIPs on the development of desirable attributes in Australian chiropractic students” (Amorin-Woods et al., 2019, p. 36). These clinical placements offer numerous educational benefits, such as the diverse case mix, which can be difficult to achieve in a campus-based chiropractic clinic (Amorin-Woods, et al., 2019).

Another mixed methods study, also from the Asia Pacific region, recruited participants from the 34 final-year undergraduate chiropractic students from the New Zealand College of Chiropractic. The study compared their perceptions of preparedness for practice

before and after a one-week rural clinical placement in Rarotonga, as well as reported demographics from these experiences (Todd et al., 2017). The particular focus of this study was on paediatric practice preparedness; however, this placement was before the students undertook the theory course in paediatrics within the curricula. This study required students to compile patient demographics and chiropractic techniques on each patient across this placement, followed by voluntary completion of a post-placement survey. From the 25 participants (response rate, 79%), results showed a positive influence on their perceived preparedness for paediatric practice following the rural placement. Perceived preparedness changed from 24.1% before the placement to 82.1% after the placement. The change was also positively correlated with the total number of children managed and the number of children under 10 years of age. The additional advantage was the diversity of patient case mix students were exposed towards their sense of preparedness (Todd et al., 2017).

These intensive clinical placements external to the institutions seemed to offer profound experiences for students to develop their required clinical and professional skills within a short period of time. Two of the studies provided these experiences towards the completion of the chiropractic program (Amorin-Woods et al., 2019; Boysen et al., 2016), which would be appropriate to a scaffolded program that progresses towards these intensive and challenging clinical experiences before transitioning to practice. The repetition of clinical process and patient treatments would provide similar expectations of professional practice and build students' efficiencies and proficiencies. The third example, somewhat earlier in the clinical program, would be the provision of an intensive experience to develop skills; the usefulness of such an intensive is perhaps limited when students had yet to cover the theory of special populations within the curriculum.

2.3.9. Clinical Placement and Students' Clinical Development

Two decades ago, Till and Till (2000) were cynical of whether the average chiropractic program sufficiently provided the preparation and necessary exposures to adequately prepare students for the professional environment in the absence of hospital placements. A recent longitudinal study (Haworth et al., 2020) investigated chiropractic and osteopathic students' clinical education in four Australian universities. The aim was to explore students' perceptions of readiness to transition to practice, their professional identity and their interprofessional clinical practice experiences from their clinical programs and clinical settings. While this qualitative study included a small chiropractic student population ($N = 15$), several themes emerged that revealed consistency across the four university programs (including the two osteopathic programs and participants of $n = 13$). The data showed that university health clinics (UHCs) prepared students adequately for their transition to practice through scaffolded supervision of patient consultations that tended to be less complex. The UHCs tended to have a patient mix of low complexity and relative familiarity to the student, such as peers in the program. As there were fewer patients seen, efficiency in care was not required. Generally, the university setting provided students with opportunities to learn from reasonably healthy patients. However, the environments external to the university, such as the community and private practice settings, prepared student participants substantially better for professional practice. Patients seen off campus were more complex and challenging, and students were provided more autonomy in these settings. Despite these varied settings, students lacked a clear understanding of the behaviours that demonstrated their professionalism. There were few IPL activities despite the presence of other health disciplines within the clinical settings (Haworth et al., 2020). Imperative to the students' development was the quality of CE; modelling from their CE in the community and private practice settings assisted with developing their professional clinical skills and professional

behaviours (Haworth et al., 2020). Relevance from this study were related to the concluding statements:

The foundation of skills attained through a scaffolded program with placement in the UHC can also contribute to this preparedness. Exclusivity to 1 type of clinical placement, such as a UHC, may not provide optimal student preparation for the professional context and may even be considered suboptimal. The importance of providing a wide range of learning opportunities for students cannot be underestimated. Such opportunities enable students to have wide exposure relevant to the full gamut of possible scenarios expected to be encountered in graduate practice. (Haworth et al., 2020 p. 10)

This study revealed some important aspects to the research question, such as the crucial importance of diversity in clinical placements, and being placed within a university setting does not guarantee IPE and IPL opportunities (Haworth et al., 2020).

An earlier 2013 report by The Institute for Alternative Futures asked the question, “where will the chiropractic profession in the United States be 12 years from now?” (p. 3.) The authors of this report interviewed chiropractic college program leaders across many topics in need of program reform and made future recommendations (Institute for Alternative Futures, 2013). In one of the seven recommendations for the entire chiropractic community, they addressed chiropractic education, recommending to increase the prevalence of clinical training in chiropractic education where “chiropractic colleges should accelerate their efforts to provide students with clinical experience in hospitals, rehab, primary care, and other treatment settings. Community health centres are beginning to offer such opportunities, and these options should be increased and expanded further” (Institute for Alternative Futures, 2013, p. 29). With the establishment of chiropractic within the US Department of Defense (DOD) and Veterans Affairs (VA) facilities, more chiropractic students are being placed in

these facilities for their clinical training. In the USA, the Veterans Health Administration was the largest provider of integrated training opportunities for chiropractic students, with many hoping this would expand further. Some of the perceived deficiencies in chiropractic clinical training have been insufficient access to real-world experiences; trends in placements suggest more students are being placed in private practice settings before licensure to provide real-world experience (Institute for Alternative Futures, 2013).

2.3.9.1. Experiential Learning in Hospital Placements

Hospital clinical placements for chiropractic undergraduate and postgraduate students have been perceived as a positive move in chiropractic education (Murphy et al., 2008; Wyatt et al., 2005). Chiropractic integration within the hospital setting is offered in chiropractic programs within Europe (Humphreys & Peterson, 2016; Myburgh et al., 2008), South Africa (Till & Till, 2000), the USA (Dunn, 2006, 2007; Dunn et al., 2009) and Canada (Kopansky-Giles et al., 2007; Puhl et al., 2017). There are no chiropractic programs in Australia that have hospital access and privileges (Walker, 2016).

Earlier it was thought that student placement within public hospitals and clinics would change the deficiencies in chiropractic clinical programs, as these clinical settings provide a much greater patient flow and patients with complex presentations compared to chiropractic teaching clinics (Till & Till, 2000). Sessions in a hospital setting can significantly expand the future chiropractors' clinical preparedness and add to interns' professional growth (Till & Till, 2000).

For example, the chiropractic program at Hanseo University in South Korea incorporates a chiropractic clinic within a multidisciplinary hospital (Ebrall et al., 2009). This presents a range of learning opportunities for students that are not available in the Australian healthcare sector (Ebrall et al., 2009). Walker (2016) perceives there are many benefits to

hospital placements for chiropractic students. The teaching and learning opportunities allow students to see actual clinical cases and patients they may have only ever learned about in theory, not in practice. In addition to the previously stated interprofessional opportunities, interactions with other health providers increase the likelihood of legitimate partnership and respect between health professions (Walker, 2016). The perceived issue with not having access to hospitals as a part of clinical placement is that there is a lack of varied clinical settings, which then potentiates limitations of case mix exposure with the usual chiropractic internship (Humphreys & Peterson, 2016; Murphy et al., 2008; Till & Till, 2000; Walker, 2016; Wyatt et al., 2005).

Several North American chiropractic programs provide hospital access for students as a routine part of their undergraduate program (Dunn, 2005; Dunn et al., 2009; Kopansky-Giles et al., 2007), in addition to competitive placements for select students of the chiropractic programs (Dunn, 2005; Dunn et al., 2009). Myburgh and Mouton (2008) perceive that chiropractic placed within the hospital provides a secondary legitimacy of the health discipline. A profession excluded from the hospital environment is handicapped for its current and potential role as a part of a healthcare team (Myburgh & Mouton, 2008). The importance and significance of hospital clinical placement for chiropractic students cannot be understated, undervalued or ignored; many authors describe its importance and benefits for chiropractic students in their clinical education (Kopansky-Giles et al., 2007; Myburgh & Mouton, 2008; Till & Till, 2000; Walker, 2016).

Several scholarly publications from European chiropractic programs detail the distinct differences in the academic and clinical education that their students experience and how being placed in the hospital setting is paving the way to a differing professional profile (Humphreys & Peterson, 2016; Johnson et al., 2008; Myburgh et al., 2008; Myburgh & Mouton, 2008). The program at the University of Zurich provides students with access to

hospitals from the commencement to the completion of their six-year program. Students have the opportunity to see real patients and pathologies, and manage complex patients, so they are well placed to manage patients as a graduate. Students' engagement in practical medical sessions within hospitals, ambulatory settings and the university teaching clinics are perceived as a significant strength of their program (Humphreys & Peterson, 2016). The students also see far more patients, contrasting the traditional chiropractic college teaching clinics, which often face challenges in attracting patients for students to manage (Humphreys & Peterson, 2016).

2.3.9.2. Benefits of Early Experiential Learning

According to European academics, there are many teaching and learning benefits by providing students with early access to experiential clinical placements, even before they are granted hands-on patient care responsibilities (Humphreys & Peterson, 2016; ECCE Commission on Accreditation, 2019b; ECCE Commission on Accreditation, 2019a). As an example, the Swiss chiropractic program provides student placement in observational roles with chiropractic field practitioners and hospital and ambulatory clinics within the first year of their program. This provides their students with the opportunity to see a variety of patient conditions, real patients and pathologies, and allows them to integrate their theory into practice (Humphreys & Peterson, 2016). Similarly, accreditation reports of several European programs stated that early and ongoing experiential learning was an important aspect of the curriculum that assisted in the early development of students' skills when provided over a variety of clinical venues and professions (ECCE Commission on Accreditation, 2019b; ECCE Commission on Accreditation, 2019a). These included observing their peers at the student teaching clinics, shadowing field practitioners (ECCE Commission on Accreditation, 2019b; ECCE Commission on Accreditation, 2019a) and placements in hospital internships working alongside other health disciplines and professions (ECCE Commission on

Accreditation, 2019a). Critical to any learning situation is developing the students' ability to reflect on their clinical practice experiences, learn from that experience and continually improve as a practitioner.

2.3.10. Reflective Practice

According to Schon (1983), reflective practice is defined as the practice by which professionals become aware of their implicit knowledge base and learn from their experience (Buwert, 2012). Chiropractic academics recommended that student assessment in the clinical setting should include more reflective learning (Ebrall et al., 2009). The ECCE report on the Welsh Institute of Chiropractic (ECCE Commission on Accreditation, 2015) received commendations for their clinical program, including their substantial clinic portfolio that provides a structure and encourages self-reflection and good practice (ECCE Commission on Accreditation, 2015). In the more recent European accreditation report on McTimoney College of Chiropractic (ECCE Commission on Accreditation, 2019b), there is a reference to the reflective portfolio of the program, which encourages self-direction and critical thinking. This was a substantial factor for compliance between the assessment and learning components of the curriculum (ECCE Commission on Accreditation, 2019b).

2.3.11. Proposals, Reforms and Recommendations for Chiropractic Education

Numerous local and international academics and industry leaders have provided commentary and debate on the need for changes and reforms in chiropractic education (Ebrall, 2018; Ebrall et al., 2009; Institute for Alternative Futures, 2013; Morgan & Morgan, 2006; Mrozek et al., 2006; Murphy et al., 2008; Simpson, 2012; Walker, 2016; Wyatt et al., 2005). The reasons for reforms provided by these authors was to improve the profile and

perception of the profession, mostly due to the profession's non-integrated status and being considered external to mainstream health care (Institute for Alternative Futures, 2013; Morgan & Morgan, 2006; Mrozek et al., 2006; Murphy et al., 2008; Reggars, 2011; Simpson, 2012; Walker, 2016; Wyatt et al., 2005).

2.3.11.1. American Perspective

Two American publications provided similar perspectives and recommendations for changes to chiropractic curricula, and criticised some of the current practices of the profession (Murphy et al., 2008; Wyatt et al., 2005). Although stemming from an 'American-centric' perspective, comparisons were made with other international chiropractic programs (Murphy et al., 2008; Wyatt et al., 2005) and with other professions, such as medicine and podiatric medicine (Murphy et al., 2008).

Both commentaries provided perspectives on perceived issues of the chiropractic profession and key deficiencies in chiropractic education (Murphy et al., 2008; Wyatt et al., 2005). The central and overarching recommendation was that chiropractic needs to take specific steps towards mainstream contemporary practice to further progress in the changing healthcare environment (Murphy et al., 2008; Wyatt et al., 2005). To achieve this, chiropractic requires a review of educational reform to overcome educational and curricular deficiencies and weaknesses (Murphy et al., 2008).

Another critique by Wyatt et al. (2005) and Murphy et al. (2008) was levelled at the American chiropractic accrediting body, the CCE. Specifically, the prescribed patient requirements during students' clinical externship mandated by accreditation were seen as problematic. With set patient quotas of 250 patient treatments as well as the radiographic requirements, the students' necessity to meet these requirements perpetuated a non-patient-centred approach to care that was predicated by numbers (Murphy et al., 2008; Wyatt et al.,

2005). This resulted in interns applying interventions, such as radiographs, or even chiropractic treatments on patients that may not be necessary (Murphy et al., 2008). Instead, the focus of clinical externship should move from the meeting of patient quotas to the development of required decision-making, patient management and professional skills (Murphy et al., 2008; Wyatt et al., 2005). In particular, a need for a patient-centred approach to care in CLEs was emphasised (Murphy et al., 2008).

As already mentioned, further concerns were the typical chiropractic clinical externship and students' experiences with a limited patient case mix (Wyatt et al., 2005), and that patient types were not reflective of that expected after graduation (Murphy et al., 2008; Wyatt et al., 2005). Other areas in need of reform included the quality and type of clinical placements and the point at which clinical externship has been provided within the program (Murphy et al., 2008; Wyatt et al., 2005). Ideally, chiropractic clinical placements should include the hospital setting and outpatient centres of excellence and should not be limited to the chiropractic college teaching clinic. Furthermore, these settings should be staffed by high-calibre clinical faculty (Murphy et al., 2008). A further recommendation was that students commence clinical placements after graduation, through an additional year to incorporate a mandatory residency program similar to that used in medicine (Murphy et al., 2008; Wyatt et al., 2005). This would replace the clinical externship during the undergraduate period and add to the program length towards professional registration (Murphy et al., 2008). A combination of clinical placement types, internship and residency requirements would improve chiropractic students' clinical competence, provide more opportunities for interprofessional relations and enhanced professional legitimacy in a similar way to podiatric medicine (Murphy et al., 2008). The quality of the graduate depends upon their student exposures and the abundance of clinical environments (Murphy et al., 2008).

The delivery of evidence-based medicine (EBM) in the chiropractic curriculum and the CLE was another suggested reform (Murphy et al., 2008; Wyatt et al., 2005). The authors expressed concern for the presence of unfounded claims within chiropractic educational institutions, which should have been providing an evidence-based curriculum already (Murphy et al., 2008; Wyatt et al., 2005;). This would require educating the educator, with members of the chiropractic faculty needing to be upskilled and qualified in providing an evidence-based approach in teaching and learning as well as applying critical-thinking skills in the classroom and the CLEs (Murphy et al., 2008).

Authors of both publications refer to the preference for chiropractic programs to be placed in a university setting instead of the traditional chiropractic college of just one health discipline (Murphy et al., 2008; Wyatt et al., 2005). The reasons include providing secondary legitimacy, improving public and interdisciplinary respect for the programs and the profession, and increasing access to IPE and IPL opportunities for faculty and students (Murphy et al., 2008; Wyatt et al., 2005).

From the perspectives of these American academics, the changes necessary for clinical programs include more interprofessional clinical opportunities, integrated clinical environments and greater exposure to more real-life patients and clinical settings similar to that of medical students, with lower reliance on traditional chiropractic college teaching clinics for clinical learning (Institute for Alternative Futures, 2013; Murphy et al., 2008; Wyatt et al., 2005). Emphasis is also placed on the need for EBE and EBP across the curriculum and clinical program, and a minimisation of the traditional eminence-based chiropractic education and teaching (Murphy et al., 2008).

2.3.11.2. Australasian Perspective

From the Australasian perspective, a key publication by Ebrall and colleagues (2009), provided a thematic review from academic leaders across eight Australasian chiropractic programs. The objective was to provide statements on best practice in chiropractic education to improve Australasian programs. They were not able to generate specific statements of best practice, yet they did identify themes and directions for chiropractic curricula that included: (a) assessing students in the clinical setting, (b) engaging students in learning research and scholarship, (c) teaching clinical skills and chiropractic technique and (d) aligning the content taught with industry (professional) practice (Ebrall et al., 2009). Regarding student assessment in the clinical setting, value was seen in implementing more reflective learning. The development of best practice in clinical skills would include students having experiences with ‘real-world patients’. Similar to the American perspectives, it was essential to move away from the strict, patient-based quantitative standards (as set by the respective Australasian accrediting body, CCEA) towards qualitative interactions in the clinical setting (Ebrall et al., 2009). Overall, the ongoing development of best practice in chiropractic education demanded close collaboration between the profession and the universities and chiropractic programs through stakeholder engagement, input and feedback.

In relation to aligning taught content with industry, it was the “knowing of the end product” that was critical to each institution (Ebrall et al., 2009 p.89). There was a need to identify input from the profession and the community, and feed this into the curriculum. Yet industry and stakeholders would include government, third-party payers, practitioners, academics, researchers and students, and not just limited to the chiropractic profession (Ebrall et al., 2009). There were few direct statements from this report relating to best practice in clinical learning and education, only of the value of the inclusion of reflective learning and students having experiences with ‘real-world patients’. There were many similarities between

the American perspective of Wyatt and colleagues (2005) and Murphy and colleagues (2008) and those of Ebrall and colleagues (2009) on the type of student experience with patients that are authentic, are aligned with industry standards and minimise the focus on meeting patient requirements at the expense of the quality of the clinical experience. However, there are no recommendations made as to how institutions achieve any of these key points.

Walker (2016), in his poignant commentary, identifies where the chiropractic profession should be as part of ‘the new chiropractic’. He states that the chiropractic profession has encountered many internally and externally driven machinations that have retarded its progress towards being a fully accepted allied health profession (Walker, 2016). He believes the graduates of the profession are competent manual therapists who contribute well to their communities and are good professional citizens; however, there are still aberrant elements with a profoundly retrograde ideology (Walker, 2016). As a solution, the author narrates a ‘ten-point plan’ for a new chiropractic that will achieve full acceptance for a profession that he considered ‘troubled’ (Walker, 2016).

The first point of Walker’s (2016) ten-point plan was ‘chiropractic education’; there is a need to improve the pre-professional education of chiropractors. One recommendation includes the need to provide hospital rounds for chiropractic students (Walker, 2016), which would increase the likelihood of legitimate partnership and respect between health professions, and allow students to observe truly unwell patients. Hospital clinical placement, combined with university-placed programs, would facilitate chiropractic integration and progress the profession away from being a siloed, marginalised profession (Walker, 2016).

2.4. Chapter Summary

This narrative review has attempted to collate and summarise thematically the available evidence from both peer and non-peer reviewed literature concerning the elements of chiropractic clinical education that contribute to developing clinical and professional skills

for graduate preparedness. The review of 56 reports, articles and publications identified that there has not been a thorough, measurable interventional study addressing the research question of this review. The narrative review included studies that measured the patient case mix of chiropractic program teaching clinics against professional profiles, and perspectives from chiropractic leaders and academics on how they wish to see the chiropractic education and profession change through their commentaries. Studies exploring the effect of clinical placements according to the student perspective were also included. The quality of clinical placements and students access to a patient case mix that reflects the professional profile was the most predominantly researched aspect of chiropractic clinical education. Minimal research has been conducted involving broader stakeholders engaged in clinical education, such as CE, members of the profession and patients seen by chiropractic students.

Several key chiropractic papers from chiropractic academics were explored and discussed. Some were critical of chiropractic curricula, clinical programs, quality of students' experiential learning and the status of the profession (Ebrall et al. 2009; Mrozek et al., 2006; Murphy et al., 2008; Walker, 2016; Wyatt et al., 2005). Several made recommendations to improve chiropractic education and professional standing.

The narrative review identified gaps whereby recent authors have directly stated that very few current studies have examined the clinical education of chiropractic students (Puhl et al., 2017) and there persists a need for chiropractic clinical education research (Ebrall, 2018; Mrozek at al., 2006; Puhl et al., 2017). There was a lack of interventional studies that directly explored from the various stakeholder perspective of the narrative research question, nor were there any experimental studies that addressed the research questions of this thesis. There remains a gap in the literature and existing research on the best practices in clinical education in chiropractic (Puhl et al., 2017), which this thesis attempts to explore from three stakeholders of chiropractic clinical education.

This first phase of the study aimed to critically examine, explore and describe the elements of chiropractic clinical education that are known to contribute to clinical and professional skills development for graduate preparedness and best practices. The specific research questions, aims and objectives of the study reported in this thesis become evident from the review of the literature. Furthermore, it became apparent that there was a lack of literature and information related to chiropractic clinical education, a dearth of interventional research with mostly commentary and opinions to draw upon (Mrozek et al., 2006; Puhl et al., 2017). Despite the available peer-reviewed and grey literature publications, a gap in evidence still exists in the chiropractic literature, particularly in relation to this study's research questions. This review further identified the gaps and inconsistencies in the body of knowledge (Baker, 2016), which subsequently justified and rationalised the necessity of this study, and further refined the research question. Exploring and dispersing the information gained from this study from both the literature review and the review of a single chiropractic institution as an exemplar of their clinical education is an important component of this study. This review contributes greatly to the chiropractic literature.

The next chapter presents the research aims, objectives, methodology and theoretical underpinnings applied to this study and research design. The rationale for the study design and the selection of the exemplar institution will also be presented.

Chapter 3. Methodology and Methods

3.1. Introduction

Chapter 1 provided the background and justification of the study. Chapter 2 presented Phase 1, the narrative review of the literature related to elements of chiropractic clinical education that contribute to clinical and professional skills development for graduate preparedness. This chapter will first present the research aims, objectives and the methodology applied to this exploratory descriptive qualitative study design in Phases 2–6. A detailed discussion is provided on the research methodology and rationale for the study design used in this research, followed by a description of the first stage of the EDQD study: the selection of the exemplar institution, the study setting. A description of the theoretical framework, the research setting and the sampling methods of each of the three participant categories during the three phases of data collection are presented. This chapter also discusses the strategies undertaken to ensure research rigour, credibility, dependability, confirmability and transferability, as well as triangulation of the data. The ethical considerations and the methods of data analysis employed across the three phases of data collection (Phases 2, 3 and 4) are stated.

The principles underpinning the methodology are those that are representative of an evidence-based approach to research; thus, the findings and suggested actions for future studies are based on extensive qualitative data gathered through the interviews and focus groups. Measures were taken to involve as many members as possible from each of the three stakeholder groups. Participation in the study was voluntary, and confidentiality was ensured.

3.2. Research Aims and Objectives

This research aimed to elicit the aspects of a clinical education program that best develop students' clinical practice skills and ascertain what constitutes quality and elements

of best practice in chiropractic clinical education, with particular reference to the type of clinical placement. The objective is to explore the views and perspectives of three distinct stakeholder groups of a single chiropractic institution to answer the study questions. The three stakeholder groups were: (a) clinical faculty members (clinical educators (CE) and clinical leadership and management (CLM)), (b) students and (c) new graduates. The objective of the study and design was not to include case studies or draw comparisons across various and multiple institutions, but an in depth exploration of a singular exemplar institution, or a “gold standard”. The overarching aim was addressed through a EDQ design using a single American chiropractic institution as an exemplar. It was thought necessary to explore multiple participant cohorts of a singular program, as opposed to one participant cohort from multiple institutions. A research project across multiple institutions and programs would result in extensive data if two, or more, institutions were part of the thesis design. This was not considered a necessity of this thesis, and may result in only surface exploration of the participants and pertinent themes if too many participants across multiple institutions.

For future studies, this may be employed across multiple programs and across differing regions. However, the culture and legislation of different countries where chiropractic is practiced (ie. Europe, North America, Australasia) would need to be considered in the research questions and design, as it is not identical across all countries where chiropractic is a registered profession.

3.2.1. Research Objectives

The following research objectives are the foundation of this study.

Phase 1 sought to:

- explore and describe elements of best practices in clinical education of chiropractors through the exploration of the literature and

- identify an institution as an exemplar to conduct the exploratory descriptive qualitative inquiry;

Phases 2–6 sought to:

- identify how chiropractic students develop clinical practice skills for professional practice and
- identify elements of a best practice model for clinical education in chiropractic programs.

3.3. Research Design and Overview

For this study, the overarching aim were addressed through a EDQ design using a single American chiropractic institution as an exemplar. This was conducted through six phases. The first phase reviewed the literature to explore common themes and elements of best practice from the chiropractic literature and explored and identified a chiropractic program as an exemplar study site. This was followed by three phases of data collection from key stakeholders: clinical faculty members (Phase 2), students (Phase 3) and new graduates (Phase 4). Collected data were analysed (Phase 5) and reported (Phase 6). The research questions addressed were:

- What aspects of the clinical education program develop student’s clinical practice skills?
- What aspects of the clinical education program do stakeholders (clinical faculty members, students, new graduates) value most and least?
- What do stakeholders (clinical faculty members, students, new graduates) perceive to be best practice in clinical education to develop students’ clinical practice skills to be practice-ready?

Commencing data collection with clinical faculty members provided insight into the background of the clinical program, in addition to answering the research questions. In-depth

interviews of clinical faculty members and new graduates and focus groups with students were the methods by which data was collected. All data were analysed thematically using an inductive process, searching for patterns and themes across the data.

3.3.1. Philosophical Assumptions

The applied theoretical perspective and approach to the research study was a constructivist paradigm, or interpretivism. The aim was to gain a deep understanding of the phenomenon in its context and then develop a pattern of meaning through the research process (Creswell, 2007). Interpretivism is grounded in the fact that “realities are multiple and socially constructed” (Riyami, 2015, p. 413). An interpretivist adopts a relativist ontology, where a single phenomenon can have multiple interpretations and where there is no basis by which truth can be determined (Creswell, 2007). The researcher’s intentions, goals and philosophical assumptions are linked to the research being conducted. By adopting this paradigm, this influenced me (as the researcher) to gather data across the three stakeholder groups about the participants’ lived experiences.

3.3.2. Ontology and Epistemology in Qualitative Research

Paradigms of inquiry are best understood as viewing positions: ways and places from which to see (Sandelowski, 2000). Paradigms of inquiry are worldviews that signal distinctive ontological (view of reality), epistemological (view of knowing and the relationship between knower and the to-be-known), methodological (view of mode of inquiry) and axiological (view of what is valuable) positions (Sandelowski, 2000). “Ontology then becomes the driver of the research design in that it drives the research’s epistemology, methodology and methods” (Hammond & Wellington, 2013, p. 115). In the qualitative research process, these are considered activities that define the research process—namely theory, method, analysis, ontology, epistemology and methodology (Denzin and Lincoln, 2000, p. 18). In addition, the researcher has their own personal biography, such as age, class,

gender, race and culture (Denzin & Lincoln, 2000, p. 18), and is influenced by their own gender and culture (Denzin & Lincoln, 2011). Thus, the researcher approaches the world with their own set of ideas, theory or framework ('ontology') that then specifies a set of questions ('epistemology'); this is then examined in a specific way through methodology and analysis (Denzin & Lincoln, 2000, p. 18).

3.3.3. Ontological Considerations and Perspectives

The ontological perspective I brought to the research was of relativism, which holds the view that reality is subjective, and can vary from person to person (Bradshaw, et al., 2017; Parahoo, 2014). Relativism argues that there are multiple constructed realities rather than a single, pre-social reality (Nightingale & Cromby, 1999). Ontology is the philosophical study of the nature of reality, or the idea of multiple realities as seen through many views (Merriam, 2009). It is a system of belief that reflects an interpretation of an individual about what constitutes a fact. Furthermore, ontology is associated with a central question of whether social entities need to be perceived as objective or subjective (Dudovskiy, n.d.). Ontological positions specify the relationship between the world and human interpretation and practice (Braun & Clarke, 2013). Qualitative description research holds the ontological position of relativism (Bradshaw et al., 2017).

3.3.4. Epistemological Considerations

Epistemology is the philosophical theory of knowledge, that is, learning how knowledge is produced (Creswell, 2013; King & Horrocks, 2010;) and acquired (Mack, 2010). Together, ontological and epistemological assumptions constitute a paradigm (Mack, 2010). How individuals know what they know means that establishing what counts as knowledge is central to the methodological approach (King & Horrocks, 2010, p. 8). The theory of knowledge is embedded in the theoretical perspective and, therefore, in the methodology (Crotty, 1998, p. 3) and the approach to analysis and reporting. My background

as a CE with decades of experience in educating chiropractors and osteopaths, provides a unique perspective to interpret how others represent their thoughts on the educative procedures, processes and perspectives. The epistemological perspective I brought to this research was subjectivism. A qualitative description approach allows and accepts that there can be many interpretations of reality; therefore, it is important that the researcher maintains a subjectivism approach. The subjective interpretation is supported through the verbatim quotes (Bradshaw et al., 2017) from the participants in the study's analysis and reporting, as this provides greater authenticity.

3.4. Selection of Methodology

3.4.1. Qualitative Design

The study addressed the research aims through an EDQ design for the following reasons. The purpose of research is to explain, control or predict outcomes, to which 'understanding' is the focus of the qualitative research paradigm (Streubert & Carpenter, 2011). Qualitative research can refer to research about persons' lives, lived experiences, behaviours, emotions and feelings as well as organisational functioning, social movements and cultural phenomena (Strauss & Corbin, 1998). The purpose and methods of qualitative research are to study human phenomena, and qualitative research is grounded in the social sciences (Streubert & Carpenter, 2011). The tradition of qualitative methods arose due to human values, culture and relationships, which are unable to be described through a quantitative method (Streubert & Carpenter, 2011).

Qualitative research produces a wealth of detailed information with increased understanding across a smaller cohort; conversely, quantitative tends to offer a broader generalised set of statistical findings in a concise mode (Patton, 2002b). Qualitative research is usually conducted in a natural setting, where researchers become the key instruments of data collection and analysis (Creswell, 2013). This data is then analysed through both

inductive and deductive reasoning (Creswell, 2013). The researcher's commitment to the participant's viewpoint is of importance, and this can be performed through interviews, observations and documentary analysis to allow the researcher to gain a real-life understanding of study participants (Streubert & Carpenter, 2011). As described by Bradshaw et al. (2017), "a qualitative description design is particularly relevant where information is required directly from those experiencing the phenomenon under investigation" (p. 1). For this study, the experiences of the three stakeholder groups are presented in the chapters 4 to 6.

3.4.2. Characteristics of Exploratory Descriptive Qualitative Research

Design

An exploratory approach was employed to explain a relatively unknown field of chiropractic clinical education. Exploratory studies aim to explore a relatively unknown field, with the purpose to:

- gain new insights into the domain phenomenon,
- elucidate central concepts and constructs,
- determine priorities for further research and
- develop new hypotheses with respect to an existing phenomenon (Uys & Basson, 1991).

The philosophical underpinnings of a qualitative description approach include:

- an inductive process,
- subjectivity, recognising the subjectivity of the experience of the participant and the researcher,
- design that develops an understanding and describes phenomena,
- a researcher who is active in the process,

- an emic stance that is influenced by the researcher because of subjectivity when interpretation occurs and conduct in a natural setting (Bradshaw et al., 2017; Sullivan-Bolyai et al., 2005).

3.4.3. Rationale for Using a Qualitative Design

An EDQ design was selected as the preferred method to investigate the research question and phenomena due to the nature of the research problem (Strauss & Corbin, 1998). EDQ research tends to provide depth and detail in what participants reveal (Patton, 2002b). Holloway and Wheeler (2002) suggest that a qualitative design seeks to explore an area where little is known, or to examine the possibilities of starting a particular research study. A quantitative methodology was not considered for this study because it is not able to describe aspects of human values, culture and relationships (Streubert & Carpenter, 2011).

Phase 1, the narrative review of the literature, revealed that there is minimal literature about clinical education in chiropractic education, and informed the research questions for this study. There was some evidence of scholarly publications investigating certain aspects of best practices in chiropractic education, such as hospital placements (Humphreys & Peterson, 2006; Murphy et al., 2008; Walker, 2016; Wyatt et al., 2005), clinical placements and patient case mix (Morschhauser et al., 2003; Puhl et al., 2017) and IPE and IPL (Johnson et al., 2008; Riva et al., 2010). The reports were mostly commentaries and opinion pieces, with few interventional studies; however, these scholarly contributions assisted in focusing the hypothesis and theories.

A study that generates insights about new phenomena is likely to utilise an inductive method, through evolving qualitative methods (Rubin & Babbie, 2009), and is preferential because it can provide depth and detail from participants (Patton, 2002b). When exploring and describing such a phenomenon, the researcher will gather the data from the perceptions and interpretations of the individuals and groups experiencing this phenomenon (Gray et al.,

2017); in this case, the individuals and groups were students, clinical educators, clinical managers and new graduates of a chiropractic clinical program. The inductive approach utilises the detailed readings of the raw data to derive concepts and themes that allow the theory to emerge from the data (Strauss & Corbin, 1998; Thomas, 2006). The analytical strategies include looking at what are the core meanings within the text that are relevant to the research objectives. From the analysis, the categories that are most relevant to research objectives are identified, and the most important themes are presented in the analysis (Thomas, 2006).

For these reasons, the EDQ design was appropriate to explore the lived experiences and perceptions of three key stakeholder groups. The EDQ design enabled identification of the important elements of the clinical program that develop chiropractic students' clinical practice skills and elements of best practice.

3.5. Theoretical Framework

For this study, the theoretical framework within which clinical education in chiropractic takes place is divided into a) theories that describe the importance of student engagement with professionals of their discipline and b) approaches students may adopt in their learning. The application of these theories of education within chiropractic clinical curricula is the focus of this study and form the research questions. The theories that relate to engaging with professionals in the clinical setting are Bandura's social learning theory (1971, 1986), Lave and Wegner's SLT (1991) and Kolb's ELT (1984). The theory that relates to approaches to learning in the clinical setting is Knowles' ALT (1988).

3.5.1. Social Learning Theory

Bandura's social learning theory originated in the field of social psychology which describes how specific behaviours could be learned through observation and imitation, in that social imitation may hasten the acquisition of new behaviours (Cherry, 2018). There are four

mediational processes proposed by Bandura, which include 1) Attention, 2) Retention, 3) Reproduction and 4) Motivation (Bandura, 1977).

In relation to this study, it is important to note that while Bandura's various models relate to the social-learning environment, they also relate to the interactions between students and their patients, CE and mentors in the CLE.

While exploring the application of Bandura's theories has not been specifically undertaken within chiropractic clinical learning, the application of social learning theory within clinical learning for nursing has been researched. Spouse (1998) describes "learning to nurse" as a "complex interaction of affective, practical and cognitive factors" (p. 345). Nursing students spend the majority of their time in a supernumerary capacity during their clinical placements and are dependent upon their mentor to engage them in increasingly sophisticated professional activities (Spouse, 1998). The author determined that through the clinical curricula, exposure to clinical practice is anticipated to promote integration between these two areas of theory and practice through the medium of mentorship and supervised practice (Spouse, 1998). Students develop enthusiasm and commitment to their professional development through social engagements of working alongside a knowledgeable and respected practitioner, and are more likely to interact with others in the clinical environment and become successful autonomous learners (Spouse, 1998).

Similarly, chiropractic students need to learn to be chiropractors. They enter the clinical arena with limited clinical skills and a volume of formalised knowledge and theoretical frameworks that contribute to their professional understanding. For that reason, this study will explore the extent to which social learning theory appears to be applied during chiropractic clinical education in the single exemplar institution.

3.5.2. Situated Learning Theory

SLT is another type of educational theory that includes two crucial learning elements: context and community (Choi & Hannafin, 1995). These concepts have been developed by Etienne Wenger (Lave & Wenger, 1991; Wenger, 1998), who emphasised the importance of CoP in guiding and encouraging the learner. The theory of SLT argues that knowledge should be learned in the same place as it used (Drew, n.d.); this highlights the importance of an authentic clinical setting for the student learner. Learning becomes a social process that is dependent upon transactions with others within a context that resembles, as closely as possible, the practice environment (Stein, 1998, p. 2). It occurs through LPP in CoP (Lave & Wegner, 1991). It revolves around the concept of a social process dependent upon transactions with others placed within a context that resembles, as closely as possible, the practice environment, and integrates the four specific elements of content, context, community and participation (Stein, 1998). It also accommodates cognitive load, which includes the use of scaffolding according to the learner's accommodation of new information, and sequencing of information to add to the complexity of tasks (Stein, 1998). The learning occurs through collaboration with the other learners and more experienced community members, in an experiential activity performing tasks of the community. With the learner's increased responsibility, they become more central and begin to understand the knowledge that distinguishes that community from others (Kaufman & Mann, 2010).

The typical COP is a group of professionals who share a craft or profession; such that:

“If you want to learn how to be a doctor, learn from doctors! You'll never learn on your own ...”. (Drew, n.d.)

The emphasis and importance of SLT are the relationships and interactions between the 'more knowledgeable' and the 'newcomer' or novice (Lave & Wegner, 1991; O'Brien & Battista, 2020). This is applicable in the service-learning environment of HPE. The other

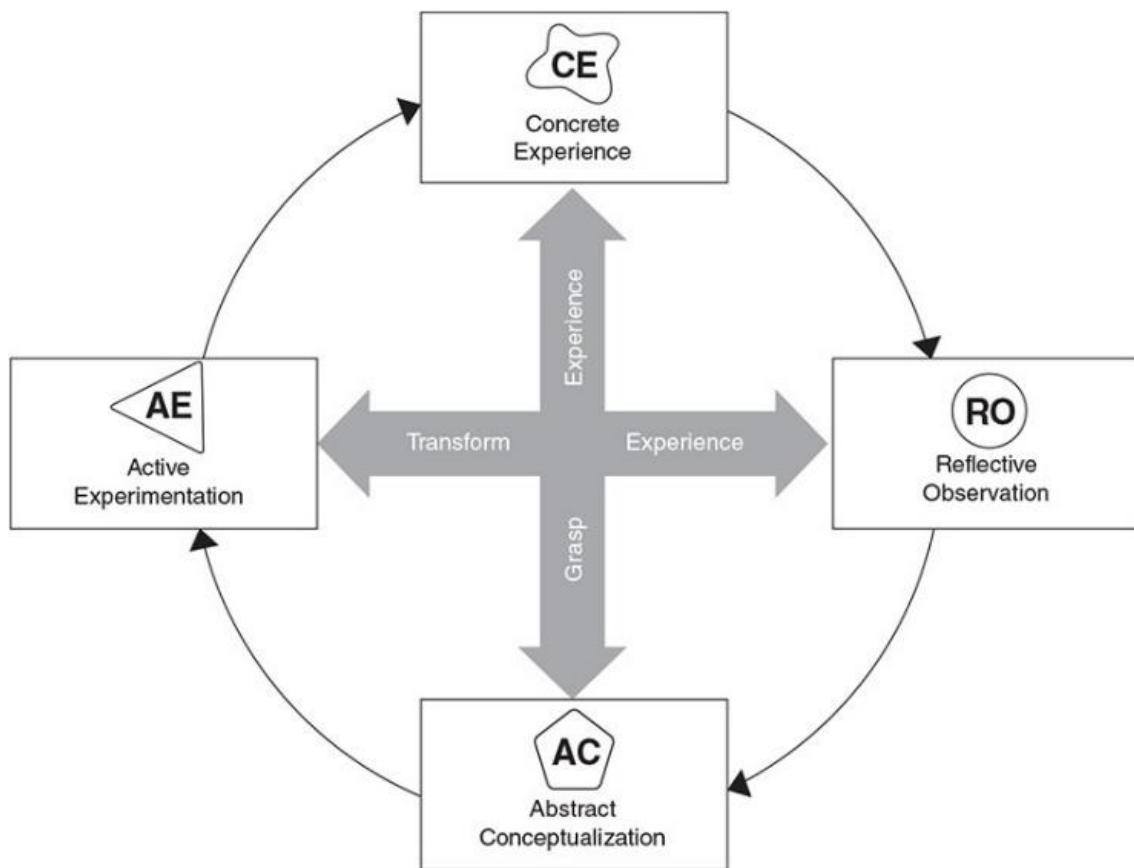
important aspect of SLT is identity, which is defined as more than just the acquisition of skills or knowledge. Identity formation emphasises how people come to know what they know and how they come to know who they are (Lave & Wenger, 1991; O'Brien & Battista, 2020). For these reasons, this theory is embraced by educators in health professions (O'Brien & Battista, 2020). SLT in HPE is mostly used to address learning processes or experiences in a particular context or program, such as clinical placements, IPE simulation and peer or professional groups (O'Brien & Battista, 2020). This study will explore how situated learning and CoP are embedded in the chiropractic students' clinical education, and how students develop their clinical and professional skills and abilities.

3.5.3. Experiential Learning Theory

The third theory demonstrating the value of students having a guide to support their learning journey is Kolb's ELT (Kolb, 1984). Kolb's ELT is described as a holistic model of learning, as it includes four stages in the cycle of learning—experience, perception, cognition and behaviour—to create knowledge through the transformation of experience (Kolb, 2014). This is a cyclical process, as represented in Figure 3.1. The four stages are mutually supportive, where a student can enter the cycle at any stage and follow through the logical sequence and cyclical manner.

Figure 3.1

Kolb's Experiential Learning Cycle



Note. From 'Experiential Learning: Experience As the Source of Learning and Development (2nd ed., Chapter 2 Figure 2.5)', by D. A. Kolb, 2014, Pearson Education. [Copyright Person- Reprinted with permission].

According to these stages in figure 3.1, Kolb identified four learning styles that highlight the conditions in which learners best learn (Kolb, 2014). These four learning styles are 'assimilators' (abstract conceptualisation (AC) and reflective observation (RO)), 'convergers' (abstract conceptualisation (AC) and active experimentation (AE)), 'accommodators' (concrete experience (CE) and active experimentation (AE)) and 'divergers' (concrete experience (CE) and reflective observation (RO)) (Kolb, 2014).

The relevance of this theory to this study is that Kolb's learning cycle (Kolb, 1984) and learner types (Kolb, 2014) define and delineate the various types of learners and how

they learn in practical and dynamic educational environments, such as the CLEs, as the student progresses towards practitioner levels of competence. For example, ELT is considered relevant to teaching in medical education, especially during clinical rotations and clerkships when learning occurs by creating knowledge through the transformation of experience in context (Mahmoud, 2015). Mahmoud (2015) provides explicit examples and teaching approaches from Kolb's ELT model for medical clerkships to improve students' learning in these settings; these can be generalised to chiropractic education. These approaches include:

- Concrete experience: students are assigned a patient to conduct the patient consultation.
- Reflective observation: students reflect on the clinical encounter, which can be triggered by feedback from an experienced clinician.
- Abstract conceptualisation: student uses the reflection to improve their knowledge, physical exam techniques and problem-solving skills through self-directed learning.
- Active experimentation: students use feedback and self-directed learning to experiment with a new approach in their skills and techniques.

For the above reasons, this study must explore the extent to which chiropractic clinical education, supervision and setting offered places of learning according to the participants' views and perspectives.

3.5.4. Adult Learning Theory

The final theory of value to this study is Knowles ALT (1988). ALT, or andragogy, refers to the theory of how adult students learn in a learner-centred way (Collins, 2004). Adults tend to be more self-directed, internally motivated and ready to learn (Learning Theories, n.d.). 'Adult learners need to be respected, valued and acknowledged for their past

experiences and have an opportunity to apply this experience to their current learning' (HETI, 2012, p. 5).

Several principles of ALT are relevant to the clinical learning of health profession students, such as chiropractic students. These include the following five points, by which adults are:

1. more self-directed in their learning and have a greater need to know why they should learn something;
2. autonomous and self-directed;
3. goal-oriented;
4. relevancy-oriented and practical; and
5. motivated to learn by both intrinsic and extrinsic motivation.

Furthermore, the following characteristics are also true of adult learners:

1. Adult learners need to be respected.
2. Adults learn best when they are active participants in the learning process.
3. Adults learn in different ways.
4. Adults learn more effectively when given timely and appropriate feedback and reinforcement of learning.
5. Adults learn better in an environment that is informal and personal. (Collins, 2004, p. 1485)

Furthermore, adults learn more effectively through experiential techniques (Brookfield, 1986; Brundage & MacKeracher, 1980; HETI, 2012). Reed et al. (2014) explored the application of the best teaching practices in medical education to transform adults from learners to effective physicians. They found four approaches were important to students' program success: experiential learning, feedback, effective relationships with peers and diverse educational methods (Reed et al., 2014).

Adults are looking for practical, problem-centred approaches to learning (Learning Theories, n.d.). Applications of ALT include social types of learning and engagements, such as timely feedback opportunities from several sources, including self, peers and instructors; and involving participants in the learning process where the instructor serves as a facilitator and not merely a provider of information or facts (Collins, 2004).

Taylor and Hamdy (2013) recommend that ALTs should influence all aspects of HPE, from outcomes to implementation and evaluation. They believe that the CLE is an ideal field for using ALTs and demonstrating their utility. Through reinforcing clear thinking in both the teacher and learner and considering the principles of ALT should improve clinical learning and clinical outcomes (p. e1571).

These examples highlight the importance of ALT for student learners in the chiropractic CLE among their peers and CE. This study will explore whether students' clinical education is inclusive of approaches for adult learners.

3.6. Research Setting

During the first phase of this study, literature review was conducted to identify key themes, by which the study setting would then be selected. Desk research was conducted to identify an exemplar chiropractic institution—a clinical program with elements of best practice (Dunn, 2005, 2006, 2007; Dunn et al., 2009; Hawk et al., 2011; Green & Johnson, 2015; Wangler & Wiles, 2011). The criteria used for selection were:

1. IPE and IPP opportunities in the clinical program;
2. varied and diverse clinical placement settings;
3. student experience with varied patient case mix; and
4. access to hospital clinical placements for students.

In particular, the hospital setting has been referred to as an ideal experiential-learning setting for chiropractic students (Murphy et al., 2008; Walker, 2016; Wyatt et al., 2005) as it

provides exposure to varied patient demographics and presentations, authentic learning environments, and a more integrated, collaborative clinical environment (Dunn, 2006; Kopansky-Giles et al., 2007; Myburgh, 2008; Morschhauser et al., 2003; Wyatt et al., 2005).

According to the four eligibility criteria, several programs from Europe and North America were identified from their scholarly publications (Dunn, 2005, 2006, 2007; Dunn et al., 2009; Hawk et al., 2011; Karim, 2011; Dr Deborah Kopansky-Giles, 2005; Kopansky-Giles et al., 2007; Pfefer et al., 2010; Riva et al., 2010; Steiman, 2000; & Myburgh et al., 2008; Wangler & Wiles, 2011). These programs were then reviewed to collect further information about their clinical program, model and placements by accessing their institution or program websites.

Students' equitable access to a variety of clinical venues and facilities and patient characteristics is important to chiropractic clinical education (Hawk, 2017; Richards, 2011; Wangler & Wiles, 2011). An American chiropractic program was chosen as an exemplar institution because of its clinical placement profile of varied clinical placement settings and student access to hospital and community clinical placements. Furthermore, this decision was supported by available information from scholarly publications, the institution website and program handbooks.

Several features of the chosen chiropractic program are important to this study. First, the institution's website states that providing an integrated approach in their clinical education prepares their students "for an increasingly integrated healthcare market which is critical to the mission, not to mention the ultimate success of their graduates" (reference withheld). Second, the chiropractic program is co-located on campus with several other health programs, such as oriental medicine and acupuncture. This provides an opportunity for education and learning of an interprofessional nature, and can ensure that graduates are fully

prepared for the integrated, collaborative healthcare model that is the future of healthcare delivery (reference withheld).

Third, IPP experience also comes from students' clinical placements in the hospital, VA clinical settings (Dunn, 2005, 2006, 2007; Dunn et al., 2009; Hawk et al., 2011; institution 2017–2018 Annual Report; institution 2018–2019 Annual Report; Wangler & Wiles, 2011), and nearby university and college health centre settings (institution handbook).

Fourth, the college's most recent 2018–2019 (reference withheld) annual report shows that they continue to add to their clinical placement profile and partnerships, with 14 remote clerkships; 10 multidisciplinary, community service healthcare facilities; 13 hospitals, including DOD and university hospitals; and VA medical centres.

Finally, their website and handbook describe their clinical model as involving four trimesters of clinical rotations across the hub-and-spoke model outpatient clinical settings. These are geographically dispersed, practitioner-driven health centres that treat unique patient populations (reference withheld). Each student is assigned to one of these 'hub' health centres, which serves as the home base for their clinical experience. Significant relationships with regional healthcare institutions—including community and VA hospitals, hospice centres, health and wellness centres—and clinics serve as 'spokes' and provide rotation opportunities for additional, concentrated clinical experiences for student interns assigned to a particular hub. These spoke facilities provide a varied range of patient case mix from military veterans to various underserved communities, university students, medically underserved geriatric populations, hospital patients in long-term care, migrant workers and indigenous populations (reference withheld). From their clinical model, it is purported this results in "cultivating patient encounters in such numbers, quality and diversity so as to enable students to develop clinical competence and best practices through a doctor-driven, patient-centred mentoring process" (reference withheld).

For the above reasons, and particularly for the diversity in clinical placements, this institution was chosen as an exemplar. Their clinical profile best suited the research objectives and questions to explore the effect of clinical placement settings on students' clinical practice skills development and graduate preparedness.

Note that throughout this study, information about this institution has been resourced through their website and has not been referenced to protect the identity of this institution.

3.6.1. Framework of the American Chiropractic Clinical Program

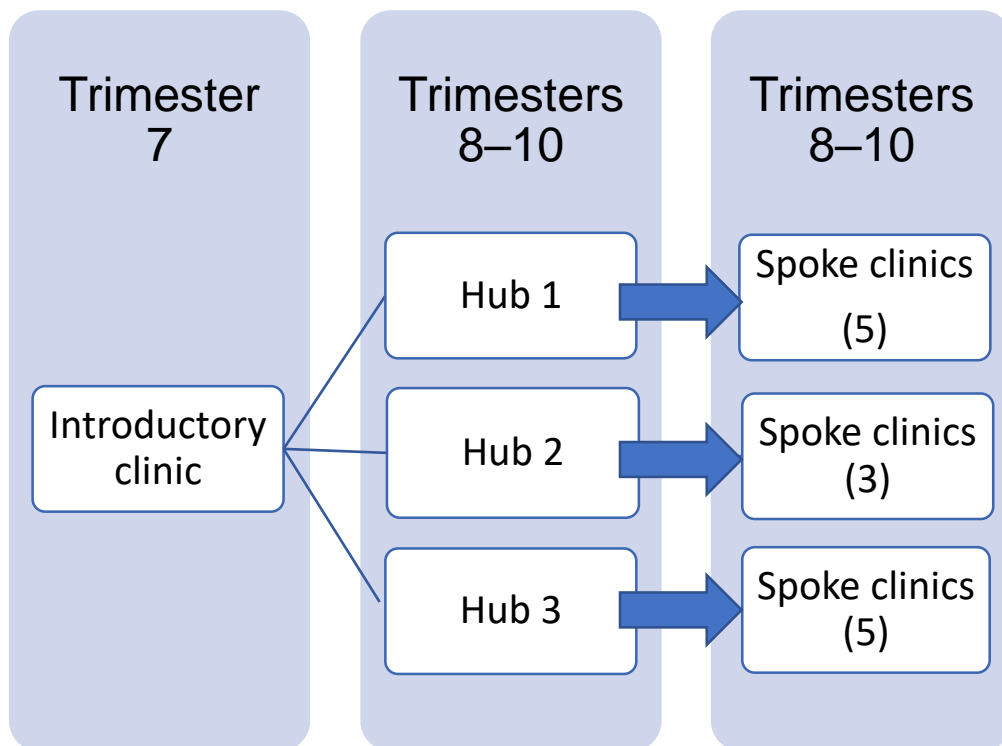
This American DCP has a minimum of ten 15-week trimesters (three years and four months of study, in total) of full-time resident study. Upon successful completion, graduates are eligible to apply for professional registration. The clinical curriculum is scaffolded as follows:

- The preclinical phase runs in trimesters 1–6.
- The clinical phase—the program's professional preparation phase—occurs during the last four trimesters (trimesters 7–10).
 - The clinical internship commences in trimester 7. Students are placed at the introductory on-campus clinic and see patients who are students and employees of the program.
 - In trimesters 8–10, students are placed in outpatient clinical settings at the institution and at various affiliate clinical settings on a rotational basis, referred to as the hub-and-spoke clinical model rotations.

The hub facilities are outpatient clinical settings located on campus and in nearby urban areas. The spoke clinics are also outpatient clinical facilities, dispersed across college campuses, community, hospitals and VA medical facilities. The clinical phase of professional preparation can be found in Figure 3.2.

Figure 3.2

Clinical Program Model



In addition to the above clinical program model in figure 3.2, students may apply for a competitive Remote Internship placement, where a select few students are placed in an external clinical facility. These include settings such as DOD, VA and accredited private practice clinics for their clinical placement in the last two trimesters of the program.

Overall, the clinical program is scaffolded with a variety of clinical placements, supervisory models, and levels of supervision and mentoring as students commence and travel through the clinical program.

3.6.2. Clinical Program: Trimesters 7-10

The clinical program continues in trimesters 7-10, as outlined in Table 3.1 and Figure 3.2. In all, students are engaged in 1320 clinical hours of experiential-learning activities. During trimester 7, there are fewer hours allocated to their clinic hours, with a significant proportion of the trimester dedicated to clinical sciences and business units. Several gradual changes occur each trimester: the adjunctive units reduce as the clinical experiential hours

increase. The adjunctive units provided in the late stages of the program comprise only business and clinical sciences.

Table 3.1

Breakdown of the Clinical Unit and Adjunct Units Per Trimester

Trimester	Clinic unit hours per week	Clinical contact hours	Adjunctive units	Total contact hours per trimester
7	2 lecture hours 6 laboratory hours	120	5 clinical sciences 2 business	405
8	2 lecture hours 20 laboratory hours	330	2 clinical sciences 2 business	405
9	2 lecture hours 20 laboratory hours	450	2 business	480
10	2 lecture hours 26 laboratory hours	420	1 business	450
Total clinical hours				1320

3.6.2.1. Introductory Clinic: Trimester 7

The introductory clinic is described as providing a transitional role between the didactic curricula and the outpatient health centre sites. In this setting, students become familiar with the service-learning environments' policies and procedures while gaining initial experience with patient care and management. Aside from direct patient contact, students

gain experience with patient care and management through lectures. With classroom support alongside their clinical placement, students are provided feedback through clinically relevant assignments and assessments to assist in their clinical development to integrate theory to practice through patient case simulations and case-based learning. A synopsis of the 7th-trimester experiential learning is provided below in Table 3.2

Table 3.2

Trimester 7 Experiential Synopsis

Introductory clinic— trimester 7	
Location	On campus
Patient case mix	Complimentary care to students and employees of the institution Least complex
Supervision and mentorship	One CE to a student pod for all of trimester 7 Ratio of one CE to multiple students and senior peer mentor per student.
Percentage of course load dedicated to clinical hours/experiential learning	30% (laboratory and lectures)

Note. CE- Clinical Educator

3.6.2.2. Hub and Spoke Clinics: Trimesters 8–10

From trimester 8 onwards, students are engaged in their clinical learning through hub-and-spoke clinical sites. At the hub clinic, a student performs patient care services under direct supervision of CE. Each student is assigned on a rotational basis to additional spoke clinics. This model offers students opportunities to experience different clinical settings that promote a variety of patient care (reference withheld).

In total, there are 16 clinical sites that provide the clinical placements during trimesters 8–10, as shown in Table 3.3. Three hub clinics are aligned with 13 spoke clinics; hub clinics 1 and 3 include five respective clinical placement sites, while hub clinic 2 includes three clinical placement sites.

Table 3.3

Hub-and-Spoke Clinical Model

Hub	Spoke
Hub 1	Five spoke clinics <ul style="list-style-type: none"> • Spoke 1: community clinic • Spoke 2: community clinic • Spoke 3: college campus clinic • Spoke 4: industry workplace • Spoke 5: VA clinic
Hub 2	Three spoke clinics <ul style="list-style-type: none"> • Spoke 1: community clinic • Spoke 2: university campus clinic • Spoke 3: community clinic
Hub 3	Five spoke clinics <ul style="list-style-type: none"> • Spoke 1: community clinic • Spoke 2: university campus clinic • Spoke 3: university campus clinic • Spoke 4: university campus clinic • Spoke 5: community clinic

The hub clinics are owned and operated by the chiropractic institution and, as such, are under the institution’s governance and business operations. The spoke clinics are community-based or hospital-based clinics, where there is an agreement between the institution and the external facility for student clinical placement.

According to the institution’s website, this program offers students ‘other experiential learning enhancements’. These are optional clinical placements that include remote internships and clerkships, preceptorships, professional clinical observations and local outreach opportunities at such facilities as DOD facilities, Veterans Administration facilities and private practice settings. A synopsis of the experiential activities and clinical profiles across trimesters 8–10 is provided in Table 3.4.

Table 3.4

Synopsis of Clinical Profiles and Experiential Learning Activities in Trimesters 8–10

Trimesters 8–10	
Location	Outpatient hub clinics in urban regions Spoke clinics located in urban settings, college campuses, hospitals and VA
Patient Case Mix	Hub clinics: <ul style="list-style-type: none"> • Community outpatients (fee-paying and insurance) Spoke clinics: <ul style="list-style-type: none"> • Complimentary care sites: treatment in free or community-care settings for underserved populations • VA medical centres: treatment for patients with complex conditions in integrated medical care settings • Higher education student health centres: treatment for college student and staff populations • Community hospitals: treatment for inpatients and outpatients in a multidisciplinary care environment
Clinical supervision	Hub: multiple CE to multiple students Spoke: ratio of one or multiple CE to multiple students Faculty clinician–driven, patient-centred educational model of care
Mentorship	Students assigned to a CE for formalised mentorship

Note. VA- Veterans Affairs, CE- Clinical Educators

According to the clinic handbook, the model of care within the health centres is a faculty clinician–driven (‘doctor-driven’), patient-centred educational model of care. This model has been described as ‘each clinician is fully engaged both with patient care and supervision of students to provide quality patient care and maximise the educational benefit to the student’. In essence, the clinician is responsible for all patient healthcare decisions (evaluation, management and record keeping) to determine the best form of patient treatment. Yet it is intended that the student will interact with the clinician in the healthcare decision-making process and participate in the authorised care as directed by the clinician (reference withheld). CE are all licensed chiropractic practitioners engaged by the chiropractic institution in a paid position.

Students are required to pass qualitative assessments (both formative and summative) and meet certain patient interaction quantitative requirements, per trimester and accumulatively, towards their eligibility to graduate. These quantitative requirements, also referred to as ‘patient numbers’, are the number of new patient and regular treatment patient interactions and other clinically based requirements. Quantitative requirements were traditionally set by the accrediting body, the CCE, but were replaced by seven meta-competencies in 2012. The seven meta-competencies are:

1. assessment and diagnosis;
2. management plan;
3. health promotion and disease prevention;
4. communication and record keeping;
5. professional ethics and jurisprudence;
6. chiropractic adjustment/manipulation; and
7. IPE.

Each of these seven meta-competencies includes curricular objectives and outcomes (Council on Chiropractic Education Accreditation Standards, 2018). However, the California state licensing board requires chiropractic applicants to prove attainment of certain ‘clinical experiences’ that include individual patient examinations (25), patient treatments (250), radiographic interpretations (30) and clinical hours (518). More detailed information is provided in Appendix B. For this reason, this participating chiropractic institution maintains the patient requirements set by California to be completed by each individual student.

3.7. Methods

This study was undertaken in six phases, which are described in this section.

- Phase 1: literature review and desk research:
 - search strategy and findings;
 - identification of an exemplar institution;
 - ethical considerations;
 - rigour of research processes;
 - credibility;
 - dependability;
 - confirmability;
 - transferability;
 - triangulation;
 - development of interview and focus group questions;
 - pilot;
 - characteristics of target populations; and
 - recruitment strategy and sampling.
- Phase 2: faculty interviews;

- Phase 3: student focus groups;
- Phase 4: new graduate interviews;
- Phase 5: data analysis; and
- Phase 6: reporting.

3.7.1. Phase 1 Study Design and Development

The search strategy that was utilised for the narrative review has been detailed in Chapter 2 (section 2.2.1).

3.8. Development of Interview and Topic Guide Questions

Interview questions were developed from the review of the literature investigating the best practices in clinical education. While there is a substantial amount of information from other health profession education on this topic, but limited chiropractic literature, several key concepts were considered important for this particular study to identify the elements that influence best practices. The concepts and themes of most interest to this study included the following:

- clinical placement type and setting,
- clinical preparedness for transition to practice,
- supervision and mentoring of students,
- IPE and IPP and
- a scaffolded approach for clinical education.

“Validity is defined as the degree to which an instrument measures what it is designed to measure” (Streubert & Carpenter, 2011, p. 455). For that reason, interview and topic guide questions were developed by the researcher and then reviewed by an expert panel for content validity. These expert members consisted of four experienced clinical practitioners/academics from the Disciplines of Chiropractic, Osteopathy, and Nursing and Midwifery. Each had over 20 years’ experience in research and scholarship and teaching in the tertiary sector—two held

positions as senior lecturers, a senior research fellow, and a program leader. Suggestions and feedback from the expert panel were considered, and modifications were made. Such refinements included changes to the questions, especially for closed-ended questions, removing redundancy among questions in the concepts being explored and ensuring that the questions being asked could meet the research aims and objectives.

3.9. Pilot Studies

A pilot study is defined as a small study that tests research protocols (Resnick, 2015). Pilot studies should be conducted in advance of a planned project, specifically to test aspects of the research design and to allow necessary adjustment before final commitment to the design (Association for Qualitative Research, n.d.). Subsequent to the peer review, the researcher undertook a pilot study to test the interview guide with a small number of participants.

Pilot studies were conducted after ethics approval had been granted. These were performed across three different populations to determine whether the questions developed were appropriately addressing the research questions, to assess the length of the interviews and to test techniques employed for the interview process. These steps were as follows:

- The interview questions for clinical faculty members were piloted with three RMIT University clinical faculty members, including a CE and leaders of chiropractic and osteopathy disciplines at RMIT University.
- The interview questions for students were piloted with students from the American chiropractic institution. These included six students from trimesters 7 and 8, comprising three male students in trimester 7, and one female and two male students in trimester 8.

- The interview questions for new graduates were piloted with three new graduates of the RMIT chiropractic program who were in their second year of clinical practice.

Following the interviews and feedback from pilot participants, amendments were made as follows:

- Several interview questions for clinical faculty members and new graduates underwent further refinements. The interviewer also monitored the length of the interview to confirm that it met the expectation of 60 minutes per interview.
- No changes were made to the student pilot questions; however, the trimester 7 student cohort was removed from the sample and no longer recruited, as it was determined that they could not adequately answer the interview questions and the research aims.

Pilot interviews and study guide question are provided in Appendix G, H and I.

These interview recordings were deleted following the completion of the three pilots, and the data has not been included in this study. The pilot studies helped refine the interviewer's technique and test whether the proposed methods and study instrument were appropriate (Van Teijlingen & Hundley, 2002).

3.10. Engagement and Coordination of the Study

During the study design period, the researcher was an employee at RMIT University, Australia. The Chiropractic Program Head at RMIT University corresponded with the president of the selected American chiropractic college about the research and requested their permission for engagement as a site for the research investigation, which was granted. From there, the researcher was instructed to coordinate the study with the research manager of the host institution.

3.11. Sampling Strategy

Using purposeful sampling (Patton, 1990), individuals were chosen based on convenience, as described by Saumure and Given (2008), and because of their firsthand experience of a phenomenon of interest (Streubert & Carpenter, 2011). This sampling approach recruited those who had an experience with the phenomena of interest, to develop a detailed description of the phenomena (Streubert & Carpenter, 2011). This included only those who were currently engaged in the clinical program: students, clinical faculty members (CE and CLM) and those with recent experiences in the clinical program: new graduates.

The CE are those placed in the CLE who are responsible for the treatment and management of patients, supervision, education, mentoring and development of the students across the clinical settings. The CLM team are responsible for developing, managing and leading the clinical program.

The student population consisted of students from trimesters 7–10. Following the pilot study with trimester 7 and 8 students, the trimester 7 students were removed from the study population, as they could not adequately contribute to the focus group topic guide questions, and hence research questions. Sampling was modified to include students in trimesters 8–10 only. New graduates were defined as those who completed the program in the previous three years.

3.12. Recruitment Strategy

3.12.1. Clinical Faculty Members

The recruitment of clinical faculty was through targeted email correspondence by the research manager to only those known to be engaged in the clinical program. Interview times were scheduled through the office manager of the research department and were confirmed with the researcher. Clinical faculty members were easy to recruit; all 15 clinical faculty

members were recruited and interviewed from the initial site visit in 2013, and no subsequent recruitment was required for the second site visit in 2015. Participants were recruited according to the following inclusion criteria

Table 3.6

Clinical Faculty Member Inclusion Criteria

Criteria
Academic and faculty members involved in the clinical component of the program, such as CE and supervisors, clinical coordinators and clinic directors
Must be between the ages of 22 and 65 years

Note. CE- Clinical Educators

3.12.2. Students

Recruitment and sampling strategies were multifaceted in the student group. This included the following:

- Students enrolled in clinical practice units 7–10 were emailed the details of the study by the research manager. Students were to contact the research manager directly to schedule a focus group session.
- Study brochures were also placed in the student rooms of the hub teaching clinics (see Appendix F) to introduce the study.
- CE were informed of the study via email and were asked to assist in the recruitment of students at the hub and spoke sites. Students were directed to contact the research manager to be placed in a focus group.
- The Clinical Director introduced the researcher to students at the on-campus hub clinic. Focus groups sessions were then conducted immediately on site.
- The researcher presented the study to students in trimesters 8–10 at a research clinical conference lecture in 2015. They were directed to a focus group sign-up

sheet at the on-campus hub clinic; the focus group was conducted the following day.

Recruitment and sampling in 2013 resulted in three students from trimester 7 and two students from trimester 8 participating in the piloting of the student interview questions. As described, the data from students in trimester 7 were removed in 2013 as a sample participant cohort and students in trimester 7 were no longer recruited. This is referred to as emergent sampling, when the researcher makes sampling decisions during the process of collecting data, which occurs commonly in field research. This comes as a result of the observer gaining more knowledge of a setting such that they can make more precise sampling decisions (Cohen & Crabtree, 2006). None of the data from pilot tests have been utilised in the analysis.

There were three focus group sessions of 11 participants conducted in 2013. Due to inadequate saturation of data, another site visit was conducted in 2015. This resulted in two focus groups of nine participants from 9–10th trimester for 20 participants in total. The details of the student criteria inclusion are included below.

Table 3.7

Student Inclusion Criteria

Criteria
Must be a student engaged in the clinical education component of the program in trimesters 7–10 (2013)
Must be a student engaged in the clinical education component of the program in trimesters 8–10 (amended in 2015)
Must be between the ages of 22 and 65 years

3.12.3. New Graduates

Data collection from new graduates occurred during both 2013 and 2015. The new graduate population were the most challenging to recruit of all cohorts. Because of this, recruitment and sampling strategies were multifaceted. In 2013, alumni services contacted all graduates from the previous three years via email to provide the study information. Only one new graduate elected to participate through this convenience sampling, and one elected to participate through snowball sampling.

The recruitment strategy was amended to include the use of a social media platform: the alumni Facebook page. This was not successful; therefore, recruitment was rested until 2015 when a second site visit was scheduled at the host institution.

In 2015, snowball sampling techniques were utilised, whereby several clinical faculty members called or sent an approved recruitment email to new graduates that met the inclusion criteria. Interested participants were directed to contact the research office manager to schedule an interview. This resulted in six new graduates being recruited for phone interviews almost immediately. Details pertaining to the new graduate inclusion criteria are provided in table 3.8.

Table 3.8

New Graduate Inclusion Criteria

Criteria
Practitioners that are new graduates from this American chiropractic program, having graduated in the previous three years
Must be between the ages of 22 and 65 years

3.13. Characteristics of the Participant Populations

Phase 2 included CLM and CE, Phase 3 included students and Phase 4 included new graduates. Participant cohorts included 15 of the 43 clinical faculty members (34.9%), 20 of the 43 students (46.5%) and eight of the 43 new graduates (18.6%). The characteristics of the participant groups is provided in Table 3.5.

Table 3.5

General Characteristics of Participant Groups

Participant population	No. of participants	Sex (male/female)
Clinical faculty members	15	12/ 3
CE	13	
CLM	2	
Students	20	10/10
Trimester 8	5	
Trimester 9	8	
Trimester 10	7	
New graduates	8	6/2
Total	43	28/15

Note. CE- Clinical Educator; CLM- Clinical Leadership/Management.

3.14. Data Collection

The data collection period was conducted from 15 March 2013 and concluded on 27 May 2015. Fieldwork visits were conducted at the institution in 2013 and again in 2015. The fieldwork approach of conducting the research on site through (a) key informant semi-structured interviews with clinical faculty members and new graduates, (b) focus groups with students and (c) review of the literature from the institution through scholarly publications

and publicly accessible information was considered the best approach for the collection of data.

All research participants could be considered 'strangers', in that the interviewer had not met the participants on any prior occasion. This included the academic faculty. While interviewing strangers can be easier in that a relationship does not need to be managed, it can be difficult to establish rapport and obtain in-depth information from an unfamiliar person (Braun & Clarke, 2013). This was the experience with some of the student focus group encounters, with initial reservations in engagement and disclosure. Another relevant concept is 'interviewing across difference', where participants may feel more comfortable disclosing to someone who is similar to them (Braun & Clarke, 2013). Throughout most of the student and new graduate focus groups and interviews, there were initial inquiries related to the researcher's background and profession, or the purpose and objective of the research. The researcher would oblige by providing the requested information, usually before commencing the recording. Consistent queries of the researcher's profession were of particular importance on reflection, as participants wanted to be determine potential bias of the researcher and a sense of trust prior to engagement. There were noted behavioural changes in some participants after this admission in that they were then willing to engage. Establishing rapport 'on the scene' by conveying a sense of interest and concern for the participant is considered important, and the participant must trust the researcher to feel comfortable in providing or revealing information (Streubert & Carpenter, 2011).

At the commencement of interviews and focus groups, the researcher would introduce themselves and the research project. The new graduate and faculty received this information via email in advance of their scheduled interviews. All participants provided signed informed consent forms prior to commencement.

All focus group sessions and key informant interviews were conducted by the chief investigator (NH). The sequencing of questions was considered important for all participant cohorts. The interview commenced with very broad, open-ended questions that may be considered less threatening, to engage participants, open communication and develop rapport (Braun & Clarke, 2013). These were then followed with more detailed and sensitive questions towards the latter part of the interviews when trust and rapport would have likely developed between the interviewer and the interviewee (Braun & Clarke, 2013). Participant bias can stem from participants responding to questions with what they may think is the right answer or what is socially acceptable, or if they are opinionated about the objective of the interview or interviewer (Shah, 2019). Researchers may ask leading questions to prompt a certain response or may interpret their data to meet a hypothesis (Shah, 2019). The researcher made attempts to minimise these types of bias. This study did not utilise member checking; however, the interviewer was sure to ask questions to confirm participants' responses or paraphrase back to participants to ensure the interviewer understood and had confirmation of meaning and concepts.

Focus group sessions and the majority of clinical faculty member interviews were conducted at the on-campus clinic and various off-site clinical facilities of the chiropractic institution and affiliated clinics. One CE interview was conducted at a professional conference. All new graduate interviews were conducted over the phone or by Skype. Interviews lasted an average of 38 minutes for new graduates, 35 minutes for clinical faculty members and 60 minutes for student focus group sessions. All sessions were digitally audio recorded with consent.

3.15. Saturation

Saturation is defined as the repetition of data obtained during the course of a qualitative study (Streubert & Carpenter, 2011) such that no additional data are being found

and the researcher can develop properties of the category (Glaser & Strauss, 1967). If the purpose is to maximise information, the sampling is terminated when no new information is forthcoming from new sampled units (Lincoln & Guba, 1985). There was an imbalance between the different participant groups—in particular, there were fewer new graduate participants ($n = 8$) than students ($n = 20$) and clinical faculty members ($n = 15$). However, the saturation of the new graduate group had been met without needing to recruit a similar number of participants when compared to the two other stakeholder groups. Sampling and saturation are intertwined in that researchers continue sampling until they achieve informational redundancy or saturation, the point at which no new information or themes are emerging from the data (Robert Wood Johnson Foundation, 2008). Furthermore, theoretical saturation occurs when “no new properties, dimensions or relationships emerge during analysis” (Strauss & Corbin, 1998, p. 143). The sample size consisted of 43 participants across the three stakeholder groups. Sampling in qualitative research often relies on small numbers that are studied in depth (Miles & Huberman 1994). According to qualitative approaches to sampling size, this study reached data saturation (Patton, 1990).

3.16. Phase 2: Clinical Faculty Member Interviews

The primary way a researcher can investigate an educational organisation, institution or process is through the experience of the individual people, the ‘others’ who make up the organisation or carry out the process (Seidman, 2006).

The semi-structured interview was considered an appropriate data collection strategy for the clinical faculty members and new graduates. Semi-structured interviews use a flexible interview protocol, supplemented with follow-up questions, that allows the researcher to explore participant thoughts about a particular topic and even delve into personal and sometimes sensitive issues (DeJonckheere & Vaughn, 2019). The benefits of this interview type are that it allows participants the opportunity to express their views in their own terms,

and can provide reliable, comparable qualitative data (Robert Johnson Wood Foundation, 2008).

For the clinical faculty members, interview questions were inclusive of their retrospective and prospective interpretations and perceptions of the students of the program, and their perceptions of the program itself. Thirteen clinical faculty were interviewed at their clinical facility workplace; one clinical faculty participant was interviewed over the phone, and another at a professional conference. All participants were interviewed using open-ended questions. Interviews were audio recorded by the researcher, with participant permission.

There were two sets of interview questions for clinical faculty members, one specifically for the CLM (Appendix J) and the other for CE (see Appendix K). Interview questions commenced with broad questions, such as exploring the context and model of the clinical program. Sensitive questions were asked further into the interview, such as exploring the clinical education's strengths and weaknesses. All participants contributed to the entire interview questions.

3.17. Phase 3: Student Focus Groups

Focus groups using a semi-structured topic guide was considered an appropriate method for the student population; this allowed for the collection of detailed information required for this study. When the researcher identified dominant participants in sessions, techniques were implemented. Participants were addressed individually to contribute to the topic guide questions so that the more vocal participants did not dominate the sessions, allowing more equal participation from all. For students, their data collection was both retrospective and prospective, as well as aspirational and interpretive through exploring their transition into the professional context.

Twenty student participants engaged in five focus group sessions. The researcher travelled across the hub and spoke clinical sites to conduct the student focus groups at times

of convenience for the students and to gain perspective of the clinical settings. Participants were requested not to identify other participants in the sessions; when this occurred, names were removed from the transcripts.

The focus groups ranged from three to five participants (see Table 5.1). Twenty-three topic guide questions were administered to the participant groups and are included in Appendix L.

3.18. Phase 4: New Graduate Interviews

The rationale for the selection of interviews for data collection has been presented in section 3.4. Individually scheduled interviews were more convenient, as the majority of new graduates had moved away from the institution and focus groups would be difficult to arrange. Thirty interview questions were administered to the participant groups and are included in Appendix M. During 2013, only two new graduates engaged in the study. Interviews were conducted over the phone on 28 March 2013. During 2015, six key informant interviews were conducted by telephone or Skype between 20 and 27 May.

3.19. Phase 5: Data Analysis

All audio interview recordings were professionally transcribed. The majority of the focus group transcripts were professionally transcribed, with the final two groups transcribed by the researcher. Transcripts were checked for accuracy against the audio recordings by the researcher. Amendments were made where there were noted omissions and errors, mostly due to professional jargon. This exercise allowed the researcher to become further immersed with the data.

The method used to analyse the final transcripts for all participant groups was thematic analysis (Streubert & Carpenter, 2011; Braun & Clarke, 2013; Clarke & Braun, 2017). Verbatim quotes from participants were tabulated, organised and coded into themes using an inductive process by the researcher and were checked by the supervisor (LJ). The

researcher used reflexivity during analysis and checked raw and coded data against all participant populations. This resulted in the reduction of themes that did not contribute to the research questions, and similar themes were collapsed.

Miles et al. (2014) describe a set of general analytic practices that can be used across various types of qualitative research. Practices used for analysis in this study include:

- assigning codes or themes to interview transcripts;
- sorting and sifting through the coded material to identify similar phrases, patterns, themes and categories as well as differences between subgroups and common sequences;
- noting reflections or remarks in memos and journals;
- elaborating on a small set of assertions, propositions and generalisations that cover the consistencies; and
- comparing the generalisations with a formalised body of knowledge in the form of constructs or theories (Miles, et al., 2014).

Credible and trustworthy analysis requires and is driven by displays that permit viewing of full data sets arranged systematically in the same location (Miles, et al., 2014, p. 108). “The matrix is an intersection of two lists, consisting of rows and columns” (Miles, et al., 2014, p. 109). Across the transcripts of this study, the raw data were developed in matrices that consisted of four columns: column 1 included the interview transcript/questions, column 2 included the interviewee(s) direct verbatim transcript, column 3 included a quotation (verbatim for quotations that were integral or important) and column 4 included the coding and analysis of the data. The third column was for extracting the meaningful and exceptional quotes—the development of columns related to the interviewer questions and related interviewee responses.

Two student focus group transcripts were developed into matrices and underwent coding by both researcher and supervisor and comparison for emergent coding. The researcher further refined the method of coding after this comparative exercise with an enhanced understanding of the process. This was then checked again between the researcher and supervisor. Emergent coding is where categories are established following some preliminary examination of the data (Stemler, 2000). By emergent coding, the author and supervisor each independently reviewed the interview transcripts and developed a set of features that formed a checklist (Stemler, 2000). The researcher and supervisor compared their notes and reconciled any differences in their initial checklists. This occurred across all phases and types of participant cohorts.

On completion of all analysis, interpretation and comparisons with the supervisor, the data analysis was converted to a written narrative format that allowed further analysis, both inductive and deductive. The analysis, interpretation and conclusion of the data are presented in the next three individual and consecutive chapters: findings from clinical faculty members are presented in Chapter 4, findings from students are presented in Chapter 5 and findings from new graduates are presented in Chapter 6.

Excerpts of this data have also contributed to two journal publications and 11 conference presentations.

3.20. Ethical Considerations

Ethics from both the host and home institutions were required for this research. Ethics approval was granted by the host institution on 19 February 2013 (Institutional Review Board (IRB) number 13-0; see Appendix C) and was granted by the home institution (RMIT University) on 19 March 2013 (ASEHAPP 02 – 13 JONES – HAWORTH; see Appendix D).

All amendments and extensions to ethics were applied and approved at both institutions (See Appendices C, D).

Within this application and during the conduct of the research, the researcher needed to exercise care towards the rights of the individuals and ensure that the institution has been safeguarded when engaged in a study (Polit & Hungler, 1999). The researcher observed basic principles in the conduct of research involving human subjects, including beneficence and autonomy. In accordance with the National Health and Medical Research Council standards (2015), these principles have been upheld throughout the entirety of the six phases of the research and resulting publications.

3.20.1. Risk Classification

This research was awarded minimal–low risk classification by the College Human Ethics Advisory Network committee at RMIT University. There were no potential power relationships between participants and any of the researchers. There was minimal expectation that the interview and type of questions would invoke any emotional distress in participants.

3.20.2. Informed Consent

In accordance, all interested participants were provided with the Plain Language Statement before signing the consent form (see Appendix E). If participants did not wish to be audio recorded, then the researcher would take notes instead. All participants were willing to be recorded. Participants were free to withdraw their consent to participate at any time and request the removal of their data from the study. No adverse events were reported, nor did any participant elect to withdraw from the study.

3.20.3. Confidentiality and Privacy

All participants gave consent to be audio recorded. Those engaged in the focus group sessions were instructed not to use the names of the fellow participants. Any names mentioned were removed from transcripts. All participants were informed that data collected

would be de-identified and allocated participant codes. Only aggregate data have been reported.

3.20.4. Data Security

In accordance with the requirements of the ethics committee, all data has been stored on a password-protected server at the home university network systems (RMIT and Federation University). These systems provide high levels of security and data integrity, secure remote access, and are backed up on a regular basis. Data are stored in password-protected files, including the audio recordings, transcripts, analysed data and the signed informed consents. Hard copies of informed consents have been maintained in a locked cabinet in a private locked office in the university. There has not been any breach of data storage.

Password-protected, portable devices, such as USB drives and hard drives, have been used for storage, archiving and data transport during the investigator's travel and when transferring files for professional transcription. The audio recordings were transcribed via the researcher and a professional transcription service. Transcripts have been accessed for data analysis by the researcher and primary supervisor only.

The original data and signed consent forms pertaining to the project have been stored for the minimum period of five years following the conclusion of the study, according to university policy. Data will be expunged after this period.

3.21. Rigour of the Research Process

In qualitative research, rigour is addressed and demonstrated by the researcher's attention to and confirmation of information discovery (Streubert & Carpenter, 2011). Guba and Lincoln (1994) identify the terms that describe operational techniques that support rigour, which include credibility, dependability, confirmability and transferability (Guba & Lincoln, 1994, as cited by Streubert & Carpenter, 2011). Furthermore, rigour depends on techniques

and methods for gathering high-quality data that are carefully analysed, with attention to reliability, and triangulation. Rigour also requires a fundamental appreciation of naturalistic inquiry, qualitative methods, inductive analysis, purposeful sampling and holistic thinking (Patton, 1999), which are the processes that were adopted throughout this study.

3.21.1. **Credibility**

Credibility addresses the ‘fit’ between the views of the participants and the researcher’s representation (Tobin & Begley, 2004). In this study, the strategies adopted to address credibility include the researcher:

- engaging in fieldwork for the entirety of six weeks across the two data collection periods (Lincoln & Guba, 1985),
- acknowledging the multiple realities, being empathetic and emphasising the research endeavour — ‘researchers as instrument’ (Lincoln & Guba, 1985),
- engaging in peer debriefing and negative case analysis (Lincoln & Guba, 1985) to provide external checks on the research process,
- engaging in dialogue with supervisors and colleagues through repeated data analysis; comparison and checking of interview and focus group coding; and reaching consensus on coding with supervisors,
- discussing with peers who have no vested interest in the study,
- testing of rival explanations that were further challenged through the supervisor in the explanation of data and
- engaging in reflexivity in an attempt to monitor and to reduce researcher bias.

Furthermore, because of the sequential nature of data collection in Phases 2, 3 and 4, the credibility of stakeholder testaments has also been addressed by the data collected across the three different stakeholder participant groups. Thus, triangulated data collection allowed

for varied perceptions and representations from participants with similar questions and interview style from the researcher.

3.21.2. **Dependability**

Dependability refers to the reliability of the research—that is, if the research were to be replicated with similar participants and research methods, it would generate results consistent with the original research (Lincoln & Guba, 1985). This is a criterion met once researchers have demonstrated credibility of the findings; triangulation of methods may contribute to dependability of findings (Streubert & Carpenter, 2011).

Thus, assumptions of dependability include ‘researcher as the instrument’, consistency in interpretation, and multiple realities (Lincoln & Guba, 1985). Some of the strategies used in this study to meet this criterion include low-inference, verbatim descriptors close to the participants’ account, mechanically recorded data, multiple and participant researchers, peer examination and triangulation (Lincoln & Guba, 1985). Furthermore, to strengthen the dependability of the study, there has been:

- an established audit trail, through providing research reports that were regularly checked and updated by the researcher and supervisor,
- an organised electronic filing of notes and interview recordings, transcripts, data analysis by multiple researchers and written documentation of the interpretation reviewed by researchers and peers and
- examination and presentation to peers on several occasions at conferences, seminars and in peer-reviewed publications.

3.21.3. **Confirmability**

Confirmability refers to the extent to which the biases, motivations, interests or perspectives of the inquirer influence interpretations (Lincoln & Guba, 1985). It is assumed that all these factors can influence the researcher’s interpretation (Lincoln & Guba, 1985).

Confirmability is said to be provided through the researcher's audit trail; this includes recording activities over time so that any other person may follow, with the objective to illustrate clearly the evidence and thought process that leads to the conclusion (Streubert & Carpenter, 2011). The researcher has addressed aspects of confirmability by:

- confirming data via checking transcripts against audio recording for accuracy and 'trustworthiness' and
- an audit of all recordings, interview transcripts, collation of data, data analysis, documents, notes and analytical memos of interviews have been conducted from data collection through to analysis.

3.21.4. **Transferability**

Transferability refers to the probability that the study findings have meanings to others in similar situations, otherwise referred to as 'fittingness' (Streubert & Carpenter, 2011). It is also defined as fit within contexts outside the study situation (Lincoln & Guba, 1985). According to Patton (1999), the utilisation of 'negative cases' enhances the quality of qualitative analysis.

To address transferability, the researcher engaged in:

- testing rival or competing themes and explanations after describing the patterns, linkages and plausible explanations through inductive analysis (Patton, 1999)
- employing thick descriptions in the analysis.

Furthermore, the actions to promote transferability in this study have been described in relation to credibility (see section 3.8.1).

3.21.5. **Triangulation**

Triangulation is a qualitative research strategy achieved through the convergence of information from different sources (Carter et al., 2014), where multiple methods or data sources are used to develop a comprehensive understanding of phenomena (Denzin &

Lincoln, 2003; Hammersley, 2002; Patton, 1999; Polit & Beck, 2012). The logic of triangulation is based on the premise that no single method ever adequately solves the problem of rival explanations. Each method reveals different aspects of empirical reality, and multiple methods of data collection and analysis provide more grist for the research mill (Patton, 1999). The researcher has employed the following types of triangulation to reduce systemic bias, in the manner described:

- **Methods triangulation:** different data collection methods were used to collect different data sets at different times (e.g., data for Phases 2–4 were collected during 2013 and 2015). The consistency of findings generated by these different approaches and the consistency in individuals' perceptions about the same issue over time were evaluated.
- **Triangulation of sources:** the consistency of different data sources within the same method was examined, which in this study included the three stakeholder groups.
- **Analyst triangulation:** multiple analysts reviewed the findings, which in this study involved checking and comparing information obtained through interviews and focus groups with program documents and institution resources to corroborate participant reports.
- **Theory and perspective triangulation:** multiple perspectives or theories were used to interpret the data, which in this study was evidenced by global analysis of the data findings through the lenses of social learning theory, SLT, ELT and ALT.

3.22. Conclusion

This chapter has provided the details related to the research paradigm, research methodology, study design and methods, data collection and data analysis. Further discussions, including ethical considerations of qualitative type research as relevant to this

study, have been presented. The reasons and justifications for using the EDQ design and thematic analysis were described. A brief synopsis and breakdown of the design and development of the research study was provided. The following three chapters will present the findings from the clinical faculty members, student and new graduates.

Chapter 4. Phase 2 Study Findings: Clinical Faculty Members’ Perceptions and Experiences of the Chiropractic Clinical Program

4.1. Introduction

As discussed in the methodology and methods chapter (Chapter 3), this thesis comprises a six-phase exploratory descriptive design that included three distinct stakeholder populations: (a) clinical faculty members, (b) students and (c) new graduates. This chapter focuses on Phase 2 of the study, the clinical faculty members’ perceptions and experiences. Clinical faculty members are comprised of the CE and CLM.

In addition to the desire to capture the clinical faculty members’ views on the important elements of the clinical program that develop clinical practice skills of the chiropractic student and the elements of best practice, another aim of the clinical faculty member interviews was to provide background information on the context of the clinical program. The research questions addressed during the interviews were:

- What aspects of the clinical education program develop students’ clinical practice skills?
- What aspects of the clinical education program do stakeholders value most and least?
- What do stakeholders perceive to be best practice in clinical education to develop students’ clinical practice-ready skills?

4.2. Characteristics of the Clinical Faculty Member Participants

Clinical faculty members comprise the CE and the CLM team. The CLM team are responsible for developing, managing and leading the clinical program. CE are those placed

in the CLE who are responsible for the treatment and management of patients, supervision, education, mentoring and development of the students across the clinical settings. The CE and CLM members are often referred to as ‘doctor’ in the quotes from the clinical faculty member, student and new graduate participants. All clinical faculty members were invited to the study in 2013 to discuss their views in individual interviews. CE from the introductory, hub and spoke clinics and CLM members participated in the study.

4.3. Description of Participants

A total of 15 clinical faculty members, consisting of 12 CE and three CLM participants, were interviewed using open-ended questions. There was an unequal sex distribution resulting from convenience sampling; twelve participants were male (80%) and three were female (20%). All information from participants was de-identified, and quotations from participants’ have been attributed using their role (CE or CLM) and a member number: CE1–CE9 and CE11–14 for the CE participants, and CLM10 and CLM15 for the CLM participants.

4.4. Interview Procedures

The alignment between education theory, the research questions and the indicative, open-ended interview questions are presented in Table 1.

Table 4.1

Alignment Between Theory, Research Themes and Faculty Interviews

Theory	Research themes	Interview questions
ELT	The education effects of clinical placements	How do the clinical placements develop the students’ clinical practice skills?

Social learning theory	The perceived value of the current clinical program	<p>What aspects of the clinical education program do clinical faculty members value most?</p> <p>What aspects of the clinical education program do clinical faculty members value the least?</p>
SLT	What constitutes best practice in clinical education to develop clinical practice skills to be practice-ready	<p>What aspects of the clinical program develop student's clinical practice skills?</p> <p>What do clinical faculty members perceive to be best practice in clinical education to develop the students' clinical practice skills to be practice-ready?</p>

Note. ELT- Experiential Learning Theory, SLT- Situated Learning Theory.

All interviews were conducted by the researcher and were audio recorded with permission. The majority ($n = 13$) of faculty interviews were conducted in person at their clinical site, with one member consulted over the phone, and another at a conference. On average, faculty interviews lasted for 35 minutes, and ranged from 13 to 60 minutes.

The interviews commenced with exploring faculty members' overall perceptions of the clinical program and the context of the clinical program, followed by exploring the strengths, weaknesses and what they believed to be best practice in developing the clinical practice skills of students.

The open-ended interview questions provided across all of the CE participant interviews are included in Appendix K. The CLM team had additional interview questions, which are provided in Appendix J.

Data saturation was identified following the 15th participant, whereby repeated themes consistently emerged. Therefore, it was established that no further interviews of participants were warranted. The following presents the results and analysis of the perceptions and perspectives of the 15 participants.

4.5. Analysis

Table 4.2 summarises the four main themes with eight subthemes emerging from the thematic analysis of clinical faculty member interviews. Throughout this chapter, the themes are illustrated with verbatim quotations from participants to provide an in-depth understanding of the thematic categories. These illustrate and describe their perceptions and experiences related to what they did and did not value from their clinical program, and what is best practice. Each theme, subtheme and subcategory is discussed.

Table 4.2

Themes and Subthemes from the Clinical Faculty Members

Theme	Subtheme	Subcategory
Clinical preparation	Preclinical preparation	
	Professional preparation	
Guided learning in clinic	Clinical placements	Introductory clinic
		Hub clinics
		Spoke clinics
	Clinical supervision	Competitive remote internships
		Doctor-driven model
		Introductory clinic
		Hub and spoke clinics
		Mentoring

	Providing feedback
	IPE, IPL and IPP
Business preparation	
Being evidence-based	EBP
	EBE

Note. IPE- Interprofessional Education, IPL- Interprofessional Learning, IPP- Interprofessional Practice, EBP- Evidence Based Practice, EBE- Evidence Based Education.

The themes have been summarised in Figure 7.1 in Chapter 7. The results, analysis and discussion of the findings from clinical faculty members are shown below.

4.6. Theme 1: Clinical Preparation

The first theme of the analysis of clinical faculty member interviews is clinical preparation. There are two subthemes within this theme: ‘preclinical preparation’ (trimesters 1–6) and ‘professional preparation’ (trimesters 7–10).

4.6.1. Subtheme 1: Preclinical Preparation

Trimesters 1–6 are technically the preclinical phase of the program, the period of the delivery of the clinical foundation. As such, the curriculum focuses on the basic and general sciences, otherwise referred to as the ‘foundational studies’. As the trimesters progress, so does the introduction of the clinical sciences. One of the observable challenges during the earlier periods can be keeping students engaged during the heavy delivery of the foundational units, with few experiential opportunities alongside the theory. As a result, students do not always realise the necessity and relevance of foundational studies curricula until this knowledge is required in the clinical context. Several CE observed that students tended to study for short-term gain, such as to pass their assessments, and not for the long-term need. However, the reality of why they had to take all these different courses became obvious when

students then enter the clinic. The reasons for this perceived lack of student engagement in theory was described by one participant:

Students are looking for real-world application. They want to know why I learned all of this crap about anatomy and about physiology and about biochemistry, and they want to understand how that applies ... in the classroom; they don't get it. And they're not really interested in learning. When they have a real patient that they don't know what to do with, then they're interested. (CE2)

The content of the foundational units is relevant to the clinical encounter. For this reason, members of the clinical faculty referred to this preclinical period as being inclusive of the clinical program. The theory was combined with some experiential-learning activities in the curricula leading up to trimester 7. The first six trimesters have more contact hours allocated to lectures and didactic delivery. Curricular documents reveal that lecture mode of delivery ranges from 17 to 21 hours per week, with an average of 56% of contact hours for delivery of lectures. Laboratory hours range from 11 to 16 hours per week, with an average of 44% of contact hours allocated for more practical activities in the preclinical period. Experiential learning increased in trimester 6, with more intensive and dedicated clinic preparatory courses. In the trimester 6 clinic unit, students are engaged in practical applications with their 'peers-as-patients', whereby clinical examinations and treatments are performed on each other in a laboratory setting. In this setting, students have opportunities to reinforce their knowledge and skills in patient examination and assessment, learn the appropriate medical and chiropractic jargon and translate this into a documented form. These purposeful, experiential activities allow students to begin to integrate foundational knowledge. Despite some of the challenges in keeping students engaged in the earlier periods of their program, when they transition into clinics, the quality of their preclinical preparation became apparent according to one educator:

As far as the appropriate way to, or the way to treat somebody—how to ask history questions, how to do the exam, how to perform the orthopaedics, how to do all those sorts of things—I think [they] are very, very, very highly trained and competent when they come in ... but overall they're very well trained coming in, I feel. (CE14)

The preclinical program prepares students well in the necessary building blocks of the clinical components. The students' recollection of core or textbook knowledge was apparent, but there were still areas in need of further development. Students struggled with integrating knowledge, being able to combine all their information into something clinically meaningful. The laboratory courses were structured towards learning but did not necessarily help students become proficient in systematically conducting a patient consultation, examination, treatment and clinical record keeping. A CE in the introductory clinic said:

Of course, this is by no fault of their own because they haven't learned this yet, is their ability to incorporate all the knowledge that they've learned and actually apply it ... it's kind of like taking all the textbooks that they've ever read from, putting them in a shredder and then just tossing in a big air balloon in puffs, like, flipping it around a bit. It's in there, it's that they have no way of accessing it, and they definitely can't organise it. But again, that's part of the clinic, that's the purpose of clinic to help them through their process. (CE3)

This became even more apparent with the increased patient load. Efficiency in performing these clinical skills developed as the students progress in their CLE with practice and repetition.

4.6.2. Subtheme 2: Professional Preparation

The second subtheme of clinical preparation was 'professional preparation'. The majority of the clinical faculty members felt they were delivering a quality clinical program in preparation for students' transition to graduate practice. The majority of clinical faculty members perceived that the clinical curricula and service-learning opportunities provided was

a strength of their DCP. There was a great deal of pride in the program according to one CE, who said that “a big thing that distinguishes us from our local competitive program is our history of clinical education and turning out some of the best and the brightest in the profession” (CE7).

During the clinical phase (trimesters 7–10), experiential learning is reflected in the clinical placement hours of the introductory hub-and-spoke model for clinical placement. These allocated clinical hours increase each trimester as the theoretical and didactic delivery reduce, with 90% of students’ clinical practice occurring in the final two trimesters of their program. There was generally a perception that the clinical program was preparing students adequately towards industry requirements and the standards of clinical practice. One CE from an introductory clinic stated:

A qualified yes is I think they are ready to see most things [health concerns] that a chiropractor treats. So I think yes, they are ready to evaluate patients, evaluate very typical chiropractic complaints and prepare to manage them reasonably, I do. (CE4)

However, students’ preparedness may not be sufficient for the more complex type of patient or clinical setting. This may depend on the students’ exposure to a variety of patient populations. As the same educator remarked: “will they have experience in integrated settings? Will they have experience with more unusual presentations? Could they have had that more the way a residency might have helped? Yes, they could have and they would be better for it” (CE4).

The clinical program has been scaffolded in the types of clinics and settings, levels of supervision and the types of patients that students see. There are graduated levels of the clinical settings. In trimester 7, students commence in a more familiar, on-campus setting, with mostly peers as patients. The supervision is highly structured and support is readily available. Progression onto the more complex hub clinics occurs in trimesters 8–10, where

students have highly supervised clinical encounters with ‘fee-paying’ outpatients from the community. During the trimesters 8–10, students progress to the spoke clinics in community and hospital settings, with more complex and varied patient populations and presentations. In these settings, students have graduated supervision and more autonomy in the clinical encounters. These factors allow for a graduated evolution of students’ development of the appropriate skills and competencies as they progress through the program.

With the exception of two participants, the majority of CE and CLM members perceived that students were competent at the time of graduating from the program. Almost half of the CE participants perceived students as competent as they entered the clinical program in trimester 7: “A qualified yes ... ready to see most things that a chiropractor treats” (CE4). Yet, leading into trimester 7, students have had mostly simulated clinical activities through experiential learning in a closely supervised laboratory setting among their peers, but have not had experience with actual patients in an outpatient clinical setting.

In contrast, there were few CE, mostly from the spoke sites, that were more conservative in their appraisals of students’ competency: “No, I think some of them think they are [competent] ... I think they’re ready for another year of training” (CE2).

However, the spoke clinics were perceived to further develop students’ competence due to the challenging patients seen in these settings. Anecdotes from students seemed to confirm these perceptions. In other words, “we have students tell us all the time that when they go back to the student hub, they feel much more confident after being here, so that’s always, I think those are the two big pluses” (CE12).

One educator commented that students tended to show strengths in their clinical and diagnostic skills:

But overall, I think most, if not all, of our interns, are capable of being successful. Not just financially successful, I’m talking about clinical proficiency, efficiency, getting patients

better. Treating somebody the way they want to be treated is also what I mean by successful.

(CE14)

Among the minority who did not feel they were producing students that were graduate-ready, one educator remarked:

No, I don't feel like that they really get that the educational side of operating a business. I'm not sure that a lot of them are even confident in diagnosing a patient and what the procedure would be once you diagnose a certain problem and where you would refer that if you needed to, how you would treat somebody. (CE8)

A few participants felt that it was not an issue unique to this clinical program, but believed that the structure of all chiropractic programs needs to undergo a review to ensure better graduate competency and preparedness. Some CE suggested the average DCP is still not sufficient in graduate preparedness. There is a need for another year of graduated and scaffolded clinical experience within more specialty clinics. This proposal implies something similar to the medical model of graduating into residencies, which was explained by one participant:

There's a need for residencies. That's not a reflection on [named institution], that's a reflection on chiropractic education. When you think about it, in the United States, the requirements to graduate are two weeks of clinical practice. That most chiropractors in the field see 10 new patients a week and see about 125 patients ... it's two weeks of practice. You can't be competent at two weeks of practice. We need to do better ... We need to have more universally available residencies where students can go and spend their extra year specialising in whatever area they want to go to and gaining real-world clinical experience. (CE2)

While they expected that most graduates could handle the usual, commonly presenting patient, it was the more complicated patient where they questioned the average

graduate's preparedness. Another participant who supported the residency program claimed this period would expose students to the more complex patients. This CE stated: 'the question is, and I think that's where residency comes in, is have they learned how to manage something unusual? And a lot of people are learning that probably on the fly' (CE4).

Beyond their professional preparedness, participants expressed some concerns for their graduates' future employability prospects based on their graduate attributes. This is not the fault of the students, but a result of what is provided in the program. Some participants perceived that the curriculum was deficient in specific specialty areas, such that if a student did not venture into additional electives beyond the program, they found their employment prospects to be challenging:

[Named institution] kind of falls short, in my opinion. A lot of first-time job offer positions that are geared more towards specific technique type; if you don't have qualifications, training certificates in those various techniques, a lot of docs [doctors] won't even look at you. (CE3)

Some CE felt that their graduates were not valued or highly sought after, with concerns that the curriculum may not be well aligned with industry expectations. This misalignment was due to the limitation in chiropractic techniques offered in the program in comparison to other chiropractic programs.

Although there was a sense that the students were well prepared clinically in their attainment of clinical competence, especially towards the end of their program, students occasionally perceived their competence to be optimal: "Now [in] ninth trimester, they kind of take the, take things over, almost too much so. Where they think that they're in control of the entire clinic, in my opinion, which obviously isn't a good thing" (CE14).

Within this period, sometimes there was an evident lack of student engagement: “They want to get out; they want to open their practice; they want to do what they want to do and not what everybody else tells them to do” (CE12).

One CE commented that students showed particular strengths towards the end of the program, such as their high enthusiasm levels. When they were enthusiastic, this appeared to enhance their potential and motivation for learning:

They're very interested in getting that, what's the next 'take-home' part that I need to have, and so they really want to know where what they're doing at any given point during the day is going to be something that's going to benefit them. (CE1)

Faculty members perceived that the preclinical curriculum prepared students well, to the extent that some even felt that students were competent during the very early phases of the clinical program. Once in the SLE, they felt students attained competence and graduate preparedness from becoming increasingly familiar with clinical procedures and expectations, from the types of clinical settings, patients and experiential learning. The minority of CE felt that students would eventually become competent as practitioners, if they did not reach competence as students. In summary, CE participants expressed a sense of pride in relation to the standard of the clinical program, and in the clinical and technical skills of their graduates. However, these graduates were not necessarily valued in the field by certain members of their profession. There were some perceived deficiencies in graduate attributes, this clinical program and the overall clinical programs for the Doctor of Chiropractic degree.

4.7. Theme 2: Guided Learning in Clinic

‘Guided learning in clinic’ is the second theme, which has been further categorised into four subthemes. These include (a) ‘clinical placement’, (b) ‘clinical supervision and mentorship’, (c) ‘providing feedback’ and (d) ‘IPE, IPL and IPP’.

4.7.1. Subtheme 1: Clinical Placements

The first subtheme of ‘guided learning in clinic’ is ‘clinical placements’. This has been further categorised according to the four types of clinical settings (see Table 4.3).

Table 4.3

Types of Clinical Placements

Subtheme 1	Subcategory
Clinical placements	Introductory clinics
	Hub clinics
	Spoke clinics
	Competitive remote internship

Clinical education aims to prepare students for real-world applications for the professional environment. One of the most significant challenges is finding those service-learning opportunities that mimic an authentic, real-life practice experience and ultimately prepare students with the required clinical practice skills. Providing clinical placement settings, clinical protocols, procedures and a patient case mix as close to, or identical to, industry expectations and requirements should be the goal of the clinical program. This is depicted in their handbook:

As a student in the ... you will obtain real & practical training in a variety of settings—from the Campus Health Center for faculty, staff and students to one of outpatient health centers located across [named] state. Broaden your hands-on training with assigned rotations at locations such as Veterans Administration medical centers, college/university health centres, clinics providing care for underserved populations, or sporting events. You will be exposed to the latest evidence-informed and clinically

relevant chiropractic concepts, prepared to meet the needs of every patient. (reference withheld)

One CE praised the institution highly for providing a ‘volume and variety’ of clinical placements within their clinical program:

I’ll brag about at [named institution], we provide more opportunities in integrated settings to educate students with complex patients than any other school in the world ... Between [named] Hospital and the VA, we have arguably the best access to complex cases of any school in the world. (CE2)

Another CE claimed that not only was the diversity of the clinical placements a strength of the program but so was ‘best practice’: “from everybody that I’ve talked to, people who’ve gone to other schools and they hear the same thing, is that the clinical education here I think is much superior to other schools” (CE12).

Clinical placements provided students with clinical experiences where they could learn about their ‘real-world’ application. However, not all of the clinical placements were perceived as being able to provide real-world ‘authentic’ clinical experience. There are 17 types of clinical placement opportunities offered to students enrolled at the institution; these are discussed in the following subcategories. Remote internships are not part of the institutions’ clinical program.

4.7.1.1. Subcategory (a): Introductory Clinic

The trimester 7 introductory clinic provides a valuable clinical experience for students transitioning from the classroom to the clinical setting. This setting is a hybrid experience between the laboratory clinic from trimester 6 and the outpatient teaching clinics in trimesters 8–10. Situated on the main campus, the introductory clinic is accessible to campus faculty members and fellow students for chiropractic care. Students are grouped into pods and are closely supervised by one CE for the entire semester. Of all the clinical placements, this is the

least reflective of real-life experience, simply because: ‘it's relatively sheltered and structured, and that's not really anything like it. And this clinic doesn't charge patients etcetera’ (CE4).

The patient case mix at the introductory clinic is more limited and familiar, with most patients being fellow students of the program. Due to this, the patients that are usually seen in this setting could be termed the ‘walking well’. It was described as follows: “that kind of fantasised, asymptomatic perfect patient among each other, seeing each other as students. They have that for about three or four months during one term” (CE3).

Yet, there were many perceived benefits of the introductory clinical experience. Students were initiated and oriented to clinical expectations, policies and procedures in a more familiar and less intimidating CLE with peers as patients. How the hub clinics, the second tier of the scaffolded longitudinal program, compare to the first-tier introductory clinics is discussed in section 4.7.1.2.

4.7.1.2. Subcategory (b): Hub Clinics

As students progress into the trimester 8 and beyond, they move into the outpatient hub clinical placements. There were three hub clinics located in urban settings and arranged as ‘fee-for-service’ clinics. At the hubs, students engaged in service-learning patient experiences with people from the community. One CE identified some weakness of these hub clinic placements, such as the long consultation times allowed to students: “I really don't feel like this here is such a real-life experience because a lot of times the patients are here for two hours. They have, I mean, they're really long appointments” (CE8).

The insufficient patient volume and the unlimited time afforded to students in the hub clinics does not reflect private practice. The hub clinics accept the patient's insurance, which means that treatments are billed under the registered practitioner/CE as a provider. The fee-for-service and insurance requirement is one particular reason for the supervisory model

adopted across these clinics, known as the ‘doctor-driven model.’ This model means that the CE or ‘doctor’ leads the patient consultations. Many CE could see how the doctor-driven clinical encounters were not always an ideal learning experience for students: “the students can’t actually adjust the chief complaint. So that doesn’t really help them either” (CE8).

However, there is a real advantage in providing this doctor-driven model for the following reasons: “they are seeing real patients and real paying patients who are on insurance or cash or what have you. So they demand basically service for their money. I think that’s a real-world experience when they get out there” (CE13).

The hub clinics were perceived as not providing as much patient diversity and complexity in comparison to the spoke clinics. However, one member of the CLM team spoke in support of the hub clinics. They said:

So you’ve got everything from sports, children, right on up through to work comp, no-fault, middle age, right through to the Medicare population. So I think within the hub health centre they’re certainly getting a diverse population, diverse diagnoses and assessable complaints that they’re dealing with. (CLM10)

The standards of the clinical care of patients at the hub clinics were similar to professional standards, but there was not the efficiency of patient care required to perform an entire patient treatment within a prescribed time frame. This was because these clinics saw fewer patients, which was reflected in the students’ schedule with patients. Some felt that the patients at these clinics were not reflective of what they would expect in professional practice. CE expressed some concerns with the quality of experience and expectations in the hub clinics.

4.7.1.3. Subcategory (c): Spoke Clinics

The spoke clinics were perceived to provide a considerably different student experience compared to the hub clinics. This was due to the variety of patient populations and

the diverse communities they served, the high patient demand and the efficiencies needed for patient encounters. With this patient diversity, it can be challenging to provide the same, or a standardised, experience for each student. Interestingly, one faculty participant perceived this diverse case mix as an inherent weakness of the program:

The lack of ability to standardise across the board. In other words, on one day we may see three hot disc patients and two spinal stenosis and traumatic brain injury, and then the next day it may be a different case mix and so you can't really standardise what the students are going to be exposed to. (CE2)

The 13 spoke clinics seemed to provide a different type of experience for the students, which was far more reflective of professional expectations. Apparently, this was because of the efficiencies required in these settings. The spoke facilities are low cost, subsidised or charge no fee for service, and this results in increased patient attendance and demand at these facilities. The patient volume necessitates time management and efficiency of the students, as highlighted by one CE: “so if they [the students] get the actual experience, it’s something similar to an associateship, and they think, okay, I can do this. I can do this in a faster manner” (CE9).

The diversity of these clinic locations, types of communities they serve and the fee structure broadens the students’ clinical experience:

Their [students’] level of responsibility increases, they start to go on rotations, the volume and variety of patient care increases, our expectation of what they will do increases, and the idea is that by the time they’ve gone through this year that they are, you know, a functioning intern with increasing levels of independence. (CE4)

Thus, the spoke clinic experience was perceived as being far more reflective of professional practice due in part to the volume and variety:

We have a lot of rotations that other schools do not have, a lot of hospital rotations that they can go to. They come back here and say, 'Whoa', especially the VA, 'I don't believe what I see there', or, 'The things I would never have thought I could practice, never thought I could treat'. (CE5)

As a result, these clinics were a more realistic experience for students:

*I know when I went to chiropractic school, I went to [named college] in the '80s and I didn't see a real patient you know ... yeah, it was the friends and family plan, right, that you talked everybody into coming. Our students get the opportunity to treat **real** patients in a **real** environment. (CE2)*

Some of these settings provide students with access to patients with considerably complex health problems and comorbidities such that 'you're seeing things that you probably would never see in private practice' (CE13). The perceived benefit is that this will prepare students well for the more common and less complex clinical presentation they will see in clinical practice, as well as for the occasional challenging patient they may encounter. This seemed to be mostly the case at the VA clinic: "... you won't see this every day, shows you this far end of the spectrum, so that when you get out and practice, every once in a while that case does come along, you'll recognise it" (CE 12).

Some participants felt that the complexity of patients at some of these placements provided students with an experience not necessarily reflective of what they would see in the profession. However, this was in a positive context, in that it tends to be more complex and varied in these clinical placements compared to that expected in private practice. The extent of patient diversity and complexity is evident in the following:

Those patients are all over the board as far as what they might come in with diagnostically speaking ... they see patients who are completely bound in wheelchairs, bedridden, have different kinds of comorbidities, complicating factors to their treatments, surgical problems,

psychological issues. I mean, they really see a very broad spectrum of disease and disorder.

(CE3)

While the patient case mix may be more than that expected of future practice, the student transformation from having these experiences is self-evident: “so the variety of experiences that interns are exposed to really gives them a lot of confidence in being able to manage, be confident that they can manage, whatever walks through the door, no matter how complex it is” (CE1).

Participants acknowledged that specific specialty patient populations do not commonly attend their teaching clinics, such as infants and children. Yet there were alternative ways that students may experience these patients outside the clinical program: *For example, there is a paediatrics club, and I know that students who kind of hold off and continue to do the paediatrics club, there are faculty and staff that bring the children in. But if you're in the paediatric club, eventually you will get your hand on a child. (CE3)*

In summary, CE were far more complimentary in their appraisals that the spoke clinics provide a more genuine and authentic experience for students. The diversity of the clinical placements offered across the 17 clinical sites meant that the students had access to a variety of patient types and clinical presentations.

There seemed to be full access to a diverse patient case mix across the hub and spoke clinics, but less access in the introductory clinic. Faculty members were entirely confident that the clinical program would prepare students well for their future professional practice because of the diversity of clinical placements and patient case mix. Conclusively, through the variety of all the clinical placements and the model of supervision offered in the clinical program, these factors were perceived as ‘best practice’.

4.7.1.4. Subcategory (d): Competitive Remote

Internships

Aside from the regular clinical program, there are other clinical placement opportunities through the Competitive Remote Internship program. Students can ‘opt in’ for one of these through a competitive application process. If successful, a student completes their clinical placement external to their chiropractic institution under a registered and approved chiropractic practitioner at a specialty facility. These placements include VA and DOD hospitals and clinical facilities, some interprofessional pain management clinical facilities and chiropractic private practice settings. The benefits of these placements include experiences that provide a bridge to the real-life practice experience. The supervisor-to-student ratios are much smaller and can even be a direct 1:1 ratio. These also allow students to venture further from the campus and still return home for their clinical experiences and to make professional contacts:

They’re actually spending time in a practice that they might wind up going working as an associate or they’re at least getting exposure to, you know, say, the billing practices or getting their feet wet as far as finding opportunities that would help them when they graduate. (CE1)

The experience of an internship is also an opportunity for students to meet professionals and ‘audition’ for potential employment opportunities as well as ease their transition into ‘real-life’ practice. These benefit both students and the practitioner/CE in allowing this experience before deciding upon an employment relationship.

4.7.2. Subtheme 2: Clinical Supervision and Mentorship

The second subtheme of ‘guided learning in clinic’ is ‘clinical supervision and mentorship’. Both supervision and mentoring are integral to students’ clinical development through interaction and modelling under social learning theory, ELT and SLT frameworks

(see section 3.5 and discussed in Chapter 7). So important is the clinical supervisor's role that several participants considered the mentoring and guidance provided by CE as the strength of the clinical program and an element of best practice.

The subtheme of clinical supervision has been categorised in Table 4.4. This is to illustrate and describe the variations in clinical supervision that occur for students across the clinical program.

Table 4.4

Clinical Supervision and Mentorship Variations Within the Program

Subtheme	Subcategory
Clinical supervision and mentorship	Doctor-driven model
	Introductory clinic
	Hub and spoke clinics
	Mentoring

As outlined in Chapter 1, Dent (2005) summaries 11 clinical supervisory models in an ambulatory outpatient clinic for medical clinical placement and supervision. These have been categorised according to the student-to-supervisor ratios (see Table 4.5). Descriptions of the models have been provided in Appendix N. These are also used to illustrate the variation in clinical supervision in this program.

Table 4.5

Supervisory Models According to Dent (2005)

Student-to-clinician ratio	Supervisory model
One student to one clinician	Sitting-in model
	Apprenticeship model
	Team member model

Multiple students to one clinician	Grandstand model
	Supervising model
	Report-back model
	Breakout model
Multiple students to multiple clinicians	Shuttle model
	Division model
	Flip-flop model
	Tutor model

In general, there was an undeniable sense of pride from one of the CLM team as to the quality of the CE, and the influence they have on the clinical program:

We should share a lot about what we do; I think we have the best clinical team that I've seen out there relative to patient care and engagement and all of those things, so I think it's definitely the most diverse institution. (CLM15)

In relation to attributes of the CE, the more experienced and tenured practitioners are usually more valued in this role in comparison to the less experienced practitioners, according to one educator, who said:

There's some pretty veteran staff members who've seen a lot of different cases, I think ... we have people that are part-time that also have a business ... the strength for sure is just the experience, years and years of experience, of different, strange cases. (CE9)

Eminence-based training and mentorship by the more experienced practitioners were highly regarded. Other positive attributes of the CE were their ability to be responsive to the dynamic environment. One CE commented that 'the clinicians they're willing to learn and change and grow still with the program and the volume and variety here' (CE4).

With the 17 clinical facilities, there are many CE employed at one and sometimes two clinical settings, which creates diversity among CE. For that reason, it can, however, be challenging to achieve consistency across all CE, including how they manage patients, supervise, educate and mentor the students. However, some participants thought that diversity could be a strength. Conversely, diversity can mean a lack of consistency, which can, in turn, affect students' ability to negotiate this situation, according to one clinical leader:

I think it's really difficult because of all the different settings that a student is exposed to, and all the different doctors that they're exposed to. I think sometimes students get confused with, 'Oh, Doctor X wants me to do things this way. Doctor Y wants me to do things this way. I don't know which way is right, which way is wrong. Why are they doing it different ways?' I think sometimes that can be challenging for students in particular. (CLM10)

In summary, a diverse approach to clinical supervision was identified. Despite these flaws, the majority of CE and CLM members were in favour of the inherent diversity.

4.7.2.1. Doctor-Driven Model

Another frequently mentioned strength, purported as 'best practice' in chiropractic clinical education by clinical faculty members, was the supervision and chiropractic care model adopted across many of the clinical placements: the 'doctor-driven model'. In the doctor-driven model of supervision, the doctoral-qualified chiropractic CE 'drives' the clinical management and patient encounters in the CLE. The doctor-driven model was cited by all CLM and CE as a model applied variously across all the clinical placement offerings of the introductory, hub and spoke clinics. One clinical leader valued this model greatly:

It promotes confidence from the patient, I think it promotes confidence from the student and certainly from the doctor's perspective; they're really able to, whether it's one-on-one, whether it's small groups, they're really in there doing what I refer to as hands-on teaching. (CLM10)

Another member of the CLM team described this model as follows:

So, any time the students are in a room with a patient, the clinician is always there, so it's one-to-one. You know, [the] clinician may have additional patients, but they're always in the room directing the students, pretty much hands-on, and the clinicians are actually treating the patients with the students, other people. We bill out for visits provided by the clinician in respect. (CLM15)

Students engaged in the doctor-driven model of supervision learn through observing and modelling actual patient care. It is expected that when the CE demonstrates a high standard of patient care, this can then have a flow-on effect on the students, encouraging them to provide a comparable level of patient care. One CE believed role modelling ensures: *They [students] understand that you know the need for various things like paperwork and going through and doing, goals and assessments and re-evaluations, those types of things, are a valuable component to the care that they are providing to the patient. (CE1)*

The reason many felt the doctor-driven approach was best practice was that: “as clinicians, we’re responsible for utilising best practices ourselves ... and we’re bringing the interns in with us as far as like making sure that they’re getting the components that are necessary” (CE1).

Despite declaring the doctor-driven model as the adopted model of the clinical program, through discussions with CE, it became apparent there were varying levels of autonomy and responsibility afforded to students. The interpretations and applications of the doctor-driven model varied among the clinical faculty members, which seemed related to the type of clinic as well as the trimester that CE supervise. The differences are further delineated according to the clinical site in the following text.

4.7.2.2. Introductory Clinic

The trimester 7 introductory clinic contains the most intensely supervised, interactive and mentored application of the doctor-driven model between students and their CE. As described by one introductory clinic CE:

We're present during every patient encounter, and so we can give in time feedback to them ... and so, directing them, being able to answer their questions as they come up rather than them going down the wrong path and then having to bring them back to square one. (CE1)

This clinic provides a unique SLE with specialised supervision and opportunities for students to consult with peers as patients. Because of this arrangement, CE could ask students more clinically challenging questions and provide real-time feedback at the bedside. This feedback may benefit both the intern and the patient because:

The patients are all students, so I feel like I have the chance to talk to both of them, actually. And, if you do it in a way that is positive and isn't threatening to the intern to have the feedback in front of just another person, it's kind of a chance to teach them both. (CE4)

During some of the student-peer consultations, senior peers (students in trimesters 8–10) are also present in the patient encounters. The senior students assist by performing some aspects of the student-patient interaction or just guide and facilitate the consultations.

4.7.2.3. Hub and Spoke Clinics

While attending the clinic sites, the researcher observed that each of the clinical settings has a model of (b) multiple students to one clinician or (c) multiple students to multiple clinicians. The exact ratios of students to supervisors are not known. Because of the hub and spoke rotations, students are mentored and supervised by various CE.

Students enter one of the three outpatient hub clinics in trimester 8. During this trimester, the doctor-driven model is seemingly quite similar to that in trimester 7 in relation

to carefully guided supervision. However, when compared to Dent's (2005) classifications (see Appendix N), this approach more closely resembles a 'team approach' to patient care:

We together manage patients ... the clinician and a student intern. So we provide clinical feedback, we guide them through patient care. Most of the time, there is a dual treatment of the patient. I will be doing some of it and the student will be doing some of it. (CE11)

As the hub clinics accept a fee for service from the patients' insurance, the patient will have their primary complaint treated by the CE/doctor, with the student also engaged in patient care. This co-treatment type of supervision has another advantage because the student can experience how doctors care and manage patients under health insurance. The co-treatment approach allows students to learn industry standards and the requirements with third-party payers while under the guidance and supervision of their CE and administrators. A CE supervising in the hub clinic said that when an insurance company is paying for the clinical services, they have particular demands that must be met:

So the insurance company wants—for instance, if Medicare wants us—this is what we have to do. If it's a new way of assessing a patient, then we have to do it. And I think that's funnelled down to the students, so when they get out there, they should know how to deal with the Medicare case versus a personal injury case. (CE13)

In addition to their CE mentoring, the students in trimester 8 may be teamed up with a student from a later trimester. This peer mentoring serves to guide and induct the junior student to the hub clinic procedures. This near-peer mentoring is not as coordinated as the peer mentoring between students in trimester 7 and those in later trimesters, but seemed to be reliant upon the CE:

The tenth-trimester students tend to work with the eighth-trimester students as they prepare to transition out. I wouldn't say that every student is necessarily a mentor; I think it's pretty

much up for the clinician's discussion ... but I would say there is nothing formally in the clinic system relative to peer mentoring. (CLM10)

When the students progress further into trimesters 8–10, they move into the spoke clinics. During this period, the doctor-driven model allows for additional and graduated levels of student autonomy. Students have more engagement and responsibility in patient care and decision-making, but are still under the guided supervision and overall responsibility of the doctor/CE. According to one CE from a spoke clinic: ‘we do have the student-driven in our spoke centres, so they’re getting more hands-on and the doctors are a little bit taken ... they’re overseeing it, of course, for safety reasons and all that’ (CE11).

The students must interact with their educators during crucial times of patient interactions and decision-making, such as changes in patient presentations, changes in diagnosis and management, and when clarification and authorisation of patient care are necessary. This transition is explained here:

In eighth tri[mester] they have more of a learning role and, as they progress and become closer to graduation, they have more of a hands-on, they pretty much dictate to us what they think the care should involve. And of course, we have to make sure that's appropriate. We still oversee everything. We actually have to contribute with care of every patient that walks in the door, regardless of who they are, what their stature is. (CE14)

The evolution of the supervisory model in the spoke clinics reflects the supervising model and the report-back model (Dent, 2005). Only one hub CE found that the doctor-driven model was not ideal and instead preferred the grandstand model:

I'm the centre, they're [students] around me, and now we have a patient and now I get to question them. And so more that way as an isocratic type of learning experience than just going over a case with them privately. (CE 5)

Overall, there was a sense that CE were providing a quality clinical program of guided clinical supervision and quality patient care. The doctor-driven model was the prevailing supervision model across the service-learning environments that was adapted according to the type of clinical setting and the students' levels of competence as they progressed in the program.

4.7.2.4. Mentoring

Aside from supervising patient care, CE engage in the mentoring of students. During the earlier phases of the clinical program, the mentoring approach is more highly structured. CE are assigned as dedicated clinical mentors and supervisors for students throughout trimester 7. In addition, a near-peer mentor—a student in trimester 8 or 9—is allocated to these junior interns: “when they start, they work with an older student, they get to mentor them as well as with a clinician. We’ve created closely structured activities that use real patients” (CE4).

CLM described the near-peer mentorship as a relatively new initiative for the clinical program. The objective of this was to assist and support junior students during the initial phases of their clinical transition. During the initial implementation, there was little perceived value from senior students as to the value of near-peer mentoring, with some difficulties with student buy-in. However, the junior students seemed to see this differently, according to one CLM: “but the students seem to find value in them. They don’t feel as nervous” (CLM15). This perception seemed to change among the senior students eventually: “I think maybe getting them to realise how they felt when they were new in clinic and how they felt uncomfortable” (CLM15).

As students transition into the hub and spoke clinics, there appears to be an informal near-peer mentoring between the students in trimester 8 and those in trimester 9 or 10. Another type of formalised student mentoring occurs during trimesters 8–10, where each

student has an assigned clinical mentor. Students and clinical mentors attend mandatory meetings at regular intervals at weeks five, 10 and 15 each trimester. According to CLM, these meetings aim to monitor and review students' clinical progress and professionalism:

The mentor is going through either students' quantitative reports, the qualitative reports, if indeed they have any incidents or remediation, they're going through that. So in my mind, a student really knows constantly where they're at in the program and how they're doing. (CL 10)

The supervision and mentoring of students is an essential component of their clinical and professional development. Mentoring happens during direct patient care as well as outside these interactions. The clinical mentorship, from both CE and near-peers, is cited as a strength of the program and is considered essential to developing students' clinical skills.

4.7.3. Subtheme 3: Providing Feedback

The fifth subtheme of 'guided learning in clinic' is the nature and manner in which feedback was provided to students. Along with supervision and mentoring, students are guided and supported in their clinical learning through feedback from their CE. The need for quality and individualised feedback is twofold: for the development and attainment of students' competencies and capabilities, and for safety in the delivery of quality patient care. Participants described the various forms and means of feedback as formal, informal, written, verbal, in the hallway or during patient care.

Informal, ad hoc and verbal feedback were frequently provided during the patient encounters. This type of feedback was typically offered to improve students' patient skills in the service-learning environment. According to a CLM member, there is an expectation of this type of feedback:

I would say pretty much debriefing from a patient visit; a lot of times it even happens right in the room relative to the placement of hands or doing soft tissue work or those types of things.

I would say the majority is done in the room, or thereafter as they're talking and discussing the case. (CLM10)

CE were conscious of being sensitive and supportive in their feedback, particularly in relation to when and where this occurred:

But I don't necessarily do it in front of a patient. Always, I pull them aside, or in between sessions. And it's always taken. They are very open to that. And I think they are definitely here to learn, but there is always critiquing going on. I mean, I still critique until the time they leave, pretty much. (CE13)

Aside from the ad hoc feedback, formalised formative assessments were also conducted for students on the clinical and professional skills related to their clinical encounters:

There's a lot of different areas of competency as far as just file reviews, there's documentation exercises, there's case follow-up and evaluation ... there's the immediate feedback of just, we have a grading rubric for adjustment documentation and all the elements that we look for in any given visit. (CE3)

Some educators provided debriefing and feedback sessions at the end of each shift. Multiple mechanisms were implemented to assess, monitor and provide timely and essential feedback to the student. CE felt there were sufficient opportunities in giving students feedback: “but the number of evaluations we have with clinicians is just huge because there's this constant trickle of feedback to everyone coming through from all these” (CE4).

The formative clinical assessments provide real-time and meaningful student feedback as well as contributing to their grades. CE complete an online assessment rubric on students' clinical performance, which is stored in an online portal for students and staff to access at any time. To ensure that the aims of these assessments were maintained, some changes were made by CLM:

We reduced the number of assessments we have, by far ... we didn't give students very good feedback, so the qualitative assessments we are doing right now are way more extensive, extremely extensive. But they only do two or three. So they get a lot of feedback. (CLM15)

The effectiveness of an assessment relies on being able to provide real and meaningful feedback. Some participants felt there was a myriad of workload demands in the clinics that sometimes impeded their ability to give feedback. Generally, participants perceived that sufficient, genuine and meaningful feedback was provided to students through multiple means to support them in clinical progressions towards graduate preparedness.

4.7.4. Subtheme 4: Interprofessional Education, Interprofessional Learning and Interprofessional Practice

The final subtheme of 'guided learning in clinic' is 'IPE, IPL and IPP'. The program displayed elements of IPE, IPL and IPP, with many chiropractic clinical placements co-located with other health professions at some hub and spoke clinics. This institution has been a pioneer in establishing chiropractic student clinical placements in various types of mainstream interprofessional settings:

We're a leader for sure ... like the VA residency system, we're one of the first institutions to establish that. You know, it's in the hospital settings and all of those elements I would say not only are we the first to establish that. (CLM15)

We provide more opportunities in integrated settings to educate students with complex patients than any other school in the world. (CE2)

Because of the clinical program's interprofessional experiences, clinical faculty members believed their graduates were well prepared for post-licensure IPP. However, there was also concern that their graduates may be less prepared for the more traditional practice setting of intra-professional practice: "we're very great with integration and into mainstream

medicine, but as far as, kind of, playing nice and getting along with existing chiropractors, we tend to fall very short” (CE3).

Varying levels and types of interprofessional engagements exist within the clinical program. The institution offers a ‘dual-enrolled’ program, where students can study more than one health program at a time. This can be a combination of chiropractic and oriental medicine or nutritional studies. All these health programs provide supervised service learning at the on-campus hub clinic. Both the dually enrolled student programs and the clinical placements were perceived by CLM to provide IPL and IPP:

[Students] are able to interact with other providers or they’re in an environment where they see clinicians interacting with other providers so they’re able to utilise or build the skills that they would need to function in that type of environment. (CLM15)

Spoke clinics provide students with access to IPP experience. These can be within the community health, hospital and VA settings. In these facilities, various allied and medical health specialties provide clinical services:

So, when they go work at some of our sites they’re working with other professionals; they’re working with medical doctors, they’re working with podiatrists, they working with physical therapists, working with whatever. I’d say even most have been in an integrated experience. (CE4)

From another perspective of interprofessional experiences, several spoke clinic placements occur at other college campuses. These colleges provide health programs, such as medicine and nursing. When students of these programs have access to chiropractic care at their health centres, this may encourage another type of IPL: “those people, if they have a good experience with you, they would be referring people to doctors out there, so it’s multi-pronged I would say” (CE9).

It is expected that the majority, if not all students, would have access to an IPP experience through the regular clinical program. With CE engaged in IPP, students have the opportunity to observe, learn and model these behaviours, which seemed to be typical practice at the VA placements:

Absolutely get the opportunity to see me as a clinician interact with other professionals. You know, I'm the Director of the pain clinic and so they get to see me function, not as a chiropractor but as a pain physician ... our students have [a] real opportunity to see how chiropractors can function in these integrated environments. (CE2)

Despite being portrayed as an integrated experience, the interprofessional experience was described as students mostly observing the interactions between their educators and other health professionals. Yet there is something still to be gained by these experiences, as they demonstrate the need for students to be respectful of other professionals:

I think the biggest thing is teaching them that we have to work together in an interdisciplinary thing, and they learn that here, especially in the hubs where they're working with MDs. They're working with other interns and stuff, they're working with specialists outside of chiropractic, and now they see where they fit in ... everyone is doing their thing for the betterment of the patient, and everyone's working together ... and I think we teach them that. (CE5)

Aside from learning how to behave and communicate, students were able to observe patient-centred care. Other forms of interprofessional engagement occurred through the sharing of electronic health records at some of these large facilities, such as the Veterans Affairs facilities: “because we have a true electronic medical record, they also get to read the records of other providers” (CE2).

As other health professionals were in close proximity, patient referrals between the various health professions were more commonplace. According to a CLM member, other types of interprofessional experiences included shadowing other healthcare practitioners: *Students are certainly able to observe other disciplines as much or as little as they would like. All of the hub health centres do, and then there's like [named] community hospital has a variety of disciplines that students can rotate through, for example, PT, social work, those types of things. (CLM10)*

Of all the interprofessional examples, limited practices of collaborative and integrated team-based patient care were evident. Participants had commendation for the IPP experiences afforded to students and CE. They perceived a negative aspect of these experiences: few students were provided such IPP opportunities after graduation. Participants recalled anecdotes of graduates moving into post-licensure IPP, but these seemed to be few. There was a belief that the graduates certainly want these collaborations; however, the professional environment had not caught up with educational settings. There was simply a lack of available professional opportunities. In other words:

They are so ready to work in an integrated setting. But when they go out to apply for a job, that's the trick. The system has to be ready to absorb them, respectfully and appropriately. These are well-trained people. And so I think they are willing and they are even able but the, at least the US healthcare system, doesn't really know how to use a chiropractor in an integrated setting. (CE4)

Yet, there did appear to be improvements towards IPP opportunities for chiropractic within the VA.

A considerable number of IPE, IPL and IPP opportunities were provided across this clinical program, as the majority of the clinical settings included other health professions.

The hospital and Veterans Affairs placements included the presence of medical professions and specialty disciplines, as well as allied health professions within the same facility.

From participant descriptions, the interprofessional experiences were mostly low-level engagements with minimal interactions in direct patient care. Higher levels of collaborative and integrated approaches, such as a team approach to patient care, were not apparent. Most interactions were happening through the sharing of clinical records, written referrals, observations of patient care, formal committees and journal clubs. However, these interprofessional experiences were considered a strength of the program. The level of these experiences seemed appropriate for the graduate, as there were few examples of integrated clinical settings for graduates to transition into. Participants were hopeful that the industry would meet the educational experiences of IPP.

4.8. Theme 3: Business Preparation

The third theme from the interviews with clinical faculty members was ‘business preparation’. CE and CLM introduced business aspects and preparation in the absence of specifically solicited questions. This was due to business preparation mostly being perceived as a weakness of the program and an area for improvement. While business aspects were believed to be a required element of the curriculum, it was overwhelmingly viewed as a significant weakness:

I think we can do a better job in the business realm. It's certainly something I know that they're [students] asking for, and we've tried to make some modifications to how to answer to some of those things, but I still think there are things that we can do better. (CE6)

Participants acknowledged how the curriculum was preparing students well for clinical aspects, but not equally well for the business aspects of practice: “how well could they survive on their own? Well, that depends on the individual’s ability to run a business, not only practice. They are competent to care for patients, so there’s my answer” (CE11).

Despite the majority of participants having confidence in the students' level of graduate preparedness, there were concerns relating to new graduates' independence: "are they ready to step in and open the door in their own office? I think that's a huge issue" (CE7).

The issue of business preparedness seemed to be the shortfall in their graduate preparedness and professional competence. A resounding opinion among half of the educators was that the graduates did not have an appropriate level of business skills needed for clinical practice in comparison to the clinical skills. This deficiency made their graduates' weak candidates in the transition to independent practice.

The majority of chiropractic graduates would move into private practice (NBCE, 2020). Business and administration knowledge and skills are necessary for private practice, as it is a small business that requires entrepreneurial abilities. For graduates, the goal is achieving competence and capabilities of independence in their clinical skills to serve their patients. But they also require the necessary business skills. While independence in practice may be the goal, participants observed their graduates were more comfortable transitioning into a semidependent employment scenario. They associated this with the necessity of needing the mentoring and guidance of a seasoned practitioner. In other words:

Quite a lot of them look for associates because they feel like they want to increase their clinical competencies, which they feel confident, but get even better. They can get the efficiency down even more and they hope to acquire business skills there. (CE9)

Some felt that the deficiencies in business knowledge and acumen were commonplace across chiropractic programs globally and were not merely a local issue. Because of this deficiency, the majority of CE perceive that students transition into an employee arrangement, such as an associateship or as a private contractor in an existing practice. Rarely do they move into independent business ventures as a new graduate.

Business and management courses were part of the curricula—some during the preclinical period, and the majority in the later trimesters of the clinical program. CE were conscious of the timing of the course. When placed too early in the program, CE felt that students lacked engagement due to not understanding the relevance of the content:

I think that's where there's some lack of focus. What students have told me in, like, fifth trimester, they get some business courses ... but when they do it in fifth tri[mester], it's kind of one of these breeze courses. Get through it, because I'm more concerned about anatomy or the basics of chiropractic manipulation ... it's one of those, you know, of the top 10 courses I take, that's number 11. (CE7)

Nevertheless, there appeared to be concerted efforts to improve the delivery of business principles and practices in the core curriculum. Towards the latter part of the program, blended learning and some case-based simulations, including ‘sample patients’, had recently been implemented. Delivering content related to business principles and practices via blended learning environment was necessary, as students could be placed across regions and sometimes interstate for their clinical placements. With the delivery of the core business topics closer to graduation, it was anticipated that students would see greater relevance and be more engaged. Despite their best efforts, some CE felt that, in terms of acquiring business management skills, learning by experience was sometimes the best way to expose students to this information: “I think they know, but they don’t understand, and there’s no way to, the only real way know it is to live it” (CE7).

Despite some of the changes and curricula adaptations to include more business aspects, it still appeared that additional support and tutelage from CE were needed to fill some of the knowledge gaps:

But I still think they need more of the business teachings, to help them and our chief of staff here is an MBA, so he's been helping them out and I've had extra classes we've been

teaching that I haven't been paid for ... I still do some of those lectures, key ones like contracts, and different things like that, just to help them out. So, they're kind of weak in that.
(CE 9)

In some instances, the educator provided personal anecdotes and experiential learning to supplement the gaps. A missed opportunity included experiential learning of business practices and principles through the teaching clinics. This included some of the necessities of everyday private practice: “the interns don’t learn a lot about billing aspects. They don’t learn a lot about how you can go out and market yourself and your practice when you get out of here” (CE14).

However, some educators adapted through teaching students billing and coding at the bedside during patient encounters. There seemed to be an inconsistency in what was being taught in the clinics by the CE. Issues occurred when some of these core business aspects were not available to all students, or were not utilised in the teaching clinics; this compounds the lack of graduate business preparedness.

A number of the spoke clinics were in a community clinic setting that offers free care for underprivileged people. Others occurred within a hospital or VA clinical settings. The business operations of the spoke clinical settings were unique and different from the hub and private practice fee-for-service clinics: “it could be a hospital base setting where, you know there isn’t really any direct billing or exchange of fees or anything like that ... so that aspect of it, it isn’t always up front for the interns to observe it” (CE1).

Inherently, these spoke settings provided a business model that is dissimilar to the private practice setting to which most new graduates will transition. Though the spoke clinics may provide an exceptional clinical experience, they do not offer a business experience that is consistent with the expectations of private practice.

Some of the more recent improvements in the business stream included new faculty positions created for the Professional Development Centre. The Centre was developed for students and alumni to have resources and support from staff dedicated to the business of chiropractic practice.

What was clear from the data was that business preparation is not a strength of the clinical program; in fact, business preparation is an area in most need of review and curricula renewal. Attention and additional investments towards making improvements to curricula and alumni services and resources have been ongoing. Sometimes, however, the students do not invest as much into the business curricula as they do for the clinical curricula. There is potential for more to be offered on business practices through experiential learning in the teaching clinics, which some participants were initiating. However, this creates inconsistent delivery that is dependent upon the CE. The spoke clinics may not reflect the business practices of private practice, which may need some reinforcement or supplementing in the curricula or, alternatively, in the hub clinics. In general, the CE saw business acumen and preparedness as an area of weakness for the graduate, where students were poorly prepared for independence in clinical practice.

4.9. Theme 4: Being Evidence-Based

The fourth and final theme from the CE is ‘being evidence-based’. There are two aspects to being evidence-based, which are categorised into two subthemes: EBP and EBE.

4.9.1. Subtheme 1: Evidence-Based Practice

CE felt strongly that the approaches and implementation of EBP within the clinical settings were elements of best practice in clinical education: “I feel most of the clinical strength would come from our evidence-influenced approach” (CE3). As practising chiropractors and CE themselves, they said that such practice reinforces their knowledge and skillset by staying abreast of current literature:

So we keep up with the most recent research that's going on in the chiropractic profession in general and we try to implement those with treatment styles or modalities or ways to treat patients appropriately or when to send them out for referral. (CE14)

The majority felt they were applying EBP to patient care in the clinics. The importance of CE following these principles of practice was based on the belief that the students would learn and potentially adopt some of these approaches:

More and more trying to get our students to understand using evidence to create effective treatment plans, and I believe that our clinicians here are really on the forefront in that, being able to teach that, but it's new to a lot of them ... to the students. (CE7)

It was clear that CE were trying to initiate and induct students in critical-thinking processes and how to use research to solve a clinical question:

If they want to do spinal manipulation, then they have to be able to justify how spinal manipulation addresses the underlying pathophysiology of what that patient has, and then we discuss what they're going to do if the patient gets better and what they're going to do if the patient gets worse. (CE2)

Teaching students to engage in critical thinking at the bedside was a feature mentioned by participants as best practice clinical education. Eminence-based training does not provide the best option for developing these essential skills of thinking:

Working in a clinical situation where you're able to draw out the knowledge of that student, their critical thinking, make sure that they understand their critical thinking when you're working with a patient and you have that student with this case. It hinges on not just giving it to the student because it's really easy to just do it yourself and let them watch you. (CE11)

Not believing what people tell you just for the sake of, because someone told it to you, but actually figuring it out yourself ... they want the answers, they want to just know, but I know that they won't learn it unless they figure it out themselves. (CE12)

Despite students seeking the clinical experiences of their educators to inform their EBP approaches to patient care, sometimes just asking the student a relevant clinical question in a patient scenario was the better approach to develop this skill: “just some really straightforward how and why questions. “Why did you do this exam? Why is it in this order? Is that the best way to do this procedure, this orthopaedic test? Why or why not?””(CE3).

As far as the different clinical venues were concerned, there appeared to be a difference in how EBP was applied across the clinical placements. Individual clinical facilities, such as the VA, were considered as leading expectations for EBP:

We give them stuff to read, we kind of show them how to manage patients properly without wasting diagnostic imaging or tests. So I think that the VA, but I think that’s the best evidence-based management that they’ll get throughout their clinical experience. (CE12)

One educator mentioned introducing and utilising the EBP question framework of patient problem or population, intervention, comparison or control, and outcome (the ‘PICO’ model) with students early on in the clinical program:

I teach the students in seventh tri[mester] the PICO model, which is just a quick way to look up evidence for your specific complaint you’re dealing with ... and we’re working on trying to help students know how to demonstrate they actually access evidence and used it to influence their plan. (CE4)

The PICO concept is an EBP model that includes framing a clinical question or specific patient problem in a particular format to help clarify the clinical question (Aslam & Emmanuel, 2010). This demonstrates how CE are trying to teach the students a student-driven approach to critical thinking and EBP.

What is evident is that they are following two of the three pillars of Michael Sackett’s definition of EBP, which also includes the patient’s unique values and circumstances (Sackett et al., 1996). In other words:

We will encourage the patient to do their own research, we'll have our own research that we provide to them and we really, you know, emphasise to the students that it's not just, you know, the textbook says this. You also have to take into consideration what is the patient most comfortable with or what is the wishes of the patient. (CE1)

The third pillar of Sackett's definition relates to the practitioner's clinical experience. Students are naturally limited in their own clinical experience. Because of this, educators encouraged students to rely more on the other components of the evidence-based model, even from the CE's clinical expertise. As a result, there did not appear to be the utilisation of the three equally weighted factors of the pillars, namely- Patient Values, Clinical Expertise and Relevant Research (Sackett, 1996).

CE felt they were following an EBP approach in their clinical practice, in bedside teaching and mentoring. Thus, reportedly, an evidence-based culture is inherent through the program; however, some educators and clinical venues varied in their expectations. Despite this, the EBP approach in the curricula and clinical program was perceived as a point of difference from other chiropractic programs, which was viewed as their strength and an aspect of best practice.

4.9.2. Subtheme 2: Evidence-Based Education

Another subtheme of 'being evidence-based' is 'EBE'. This subtheme relates to the EBE of the CE; an educator's knowledge and skills can directly affect the student and patient experience in the service-learning environment. The regular upskilling of the CE is critical and an element of best practice.

State registration for chiropractic practitioners mandates that they engage in continuing education annually to maintain their professional licensure. While continuing professional development is an individual practitioner's responsibility, there appeared to be additional support provided by the institution for CE professional development and

upskilling. This was by providing CE with learning material, such as manuals and in-house training programs, to assist them in their roles as CE—all of which outline ‘best practice’ in clinical education. The manuals include patient care protocols and clinical care standards, including the literature as an evidence-based resource for patient care. These reportedly provided a valuable resource and a vital link for a consistent and informed approach to the curricula, the clinics and clinical education. One educator noted the continual updates about clinical practices in these ‘live documents’:

We’re constantly updating our manual. Pieces are always being revised and it’s saying, like, “Well, based on these reports, this Cochrane study, whatever happens to be coming up at the time”, the different flow diagrams are just being offered in the classroom. (CE3)

Another educator explained the purpose of these regular updates:

Communication with clinical faculty and teaching faculty, to make sure that what is being taught in the classroom is consistently reinforced in the health centres ... we’ve really tried to put a system in place to bridge any gaps that we have been able to find. (CE6)

The institution has demonstrated its commitment to support postgraduate education for the clinical education team. One was a Doctorate of Philosophy student, and several others were supported through a Master’s degree. One said, “well, most of the clinicians here do have Master’s degrees. So the school will pay them, pay for them to get trained, which is good. In different areas, public health, things they thought would be needed” (CE9). The institution also supports CE by training them in research. One educator commented they were both consumers and producers of research: “we need to get trained and stay current in the literature and try and follow best practices in the literature, whether we’re creating those best practices ... because, honestly, we’re also producing some of this literature that’s being made” (CE11).

Furthermore, the importance of their providing evidence-based approaches in education and clinical practice was evident: “it’s a team that’s trying to keep the college current with the CCE regulations and yet still best practices and quality care. That’s our mission” (CE11). However, not all participants felt as informed or educated in best practice approaches: “I would not say that we in the, as clinicians, have been given a lot of education about best practices for clinical education” (CE2).

It appears that the availability of professional development and support for CE is somewhat dependent upon their clinical location, as a hub or a spoke clinical site. The CE who felt less informed were mostly from the spoke sites. They were limited by being provided formal directions or instructions on how they should perform in their CE roles. In other words, while they may have a strong clinical background, they did need upskilling on how to be educators. This was because:

I wasn't trained as an educator, I was trained as a chiropractor ... I didn't understand what that means and being able to say here's where a student is, where they need to be able to go, I think to bring in clinical pedagogy to a higher level and a better understanding and to think of all the clinicians as educators and that they need to know this stuff is definite. (CE4)

Another educator from the introductory clinic stated that they were encouraged to attend a clinical education seminar, which they found valuable for their skill development and subsequently implemented this into the clinic:

I attended a post-, like a pedagogy continuing event kind of a thing, and it talked about this one-minute preceptorship thing ... it made a couple of really good points in it, and it kind of helps give you, like, an abridged version of how to approach the student interaction when it comes to clinical decision-making ... so I'm still learning [laughs], which is nice, and I'm always trying to look for ways to really help the students. (CE3)

In summary, there appeared to be several elements of evidence-based culture in practice and education in the clinical program and among the clinical program members. An EBP approach was delivered across the curricula, and resources, such as clinical manuals and handbooks, were shared among students and CE. These resources helped bridge the evidence-based curricula in the management of patients, and upskilled students and CE. There was concern that not all CE seemed to be equally informed or consistent in their approaches; team-produced resources were one way to provide a more consistent approach. With these various means of EBP and educating the students and educators, participants felt they were achieving best practice and preparing students' clinical practice skills well.

4.10. Summary

The key points from the thematic analysis of the clinical faculty member interviews conducted in Phase 2 are as follows.

4.10.1. Clinical Preparation

Majority of participants felt that they were providing a quality clinical program, preparing students adequately for their entry into the clinic and into the profession. Overall, students were reported as reaching clinical competence during the clinical program before entering the profession.

4.10.2 Guided Clinical Learning

In general, participants felt they were adequately provided for all of the subtheme domains and subcategories, which they attributed as elements of best practice of their clinical program. The purposely designed, longitudinal and scaffolded program of the hub and spoke clinics and the doctor-driven model contributed to guided learning in clinic theme and subthemes. The program has been developed to provide a student-centred learning approach across the various CLEs with graduated levels of supervision and mentoring by a variety of

CE. Students experienced a varied patient case mix and worked with other health professions in integrated clinical settings.

4.10.3. Business Preparation

Business preparation was an area considered a weakness of the clinical program and in most need of development for graduate preparedness and clinical practice skills. This was an area where clinical faculty members felt they were not performing at the required level in the curriculum or experiential learning. CE thought they were providing a quality clinical program where their graduates performed highly in their clinical and diagnostic skills, but not in their business and entrepreneurial skills.

4.10.4. Being Evidence-Based

EBP and using an evidence-based approach to clinical education was an area that participants felt had been catered for well in the curricula and in the clinical setting. Being evidence-based is where they felt they were well placed to deliver quality supervision across the curriculum and clinical culture, including two of the three pillars of Sackett's definition (1996). There were, however, some variations in implementation, which seemed dependent upon the clinical setting and the CE. The EBP approach within their curricula provides the necessary clinical practice skills for their graduates. EBE related to 'educating the educator' in areas of research, investing in the clinical faculty to provide them with more credentials and providing teaching and learning resources and support in their clinical roles. This was an area where only a minority felt they were not well prepared as CE; they needed further development and support in their roles. Participants appraised both EBP and EBE as a strength of their program and elements of best practice.

Next, Chapters 5 and 6 present the students and new graduate analyses, respectively.

Chapter 5. Phase 3 Study Findings: Students' Perceptions and Experiences of the Chiropractic Clinical Program

5.1. Introduction

Chapter 4 presented the analysis and discussion of the Phase 2 Study findings from the clinical faculty members interviews. This chapter provides a detailed analysis of Phase 3, the students' perceptions and experiences of the clinical program.

The aim of Phase 3, reported in this chapter, was to present the students' voice as to the important aspects of the clinical program that develop the chiropractic student's clinical practice skills, and the elements of best practice. The analysis explored and described the phenomena from one of the three cohort perspectives from a North American chiropractic program.

The research questions addressed were:

- What aspects of the clinical education program develop students' clinical practice skills?
- What aspects of the clinical education program do students value most and least?
- What do students perceive to be best practice in clinical education to develop students' clinical skills so they are practice-ready?

5.2. Characteristics of the Student Focus Group Participants

By convenience and purposive sampling, 26 students from trimesters 7–10 were recruited for this study. Participants ranged in age from 25 to 40 and were equal in sex distribution. The trimester 7 students were removed as a sample cohort from the study as they were unable to contribute to the research questions and data saturation adequately. The pilot group interviews were not included in the data analyses due to the high proportion of

trimester 7 participants. The final sample included 20 students in trimesters 8–10. There were no changes made to the topic guide questions following the pilot sessions, with these questions utilised as a topic guide for the remainder of the focus groups.

The demographic distribution of the participants by trimester was:

- trimester 8: $n = 5/20$, 25%,
 - male: $n = 2/20$, 10%,
 - female: $n = 3/20$, 15%,
- trimester 9: $n = 8/20$, 40%,
 - male: $n = 6/20$, 30%,
 - female: $n = 2/20$, 10%,
- trimester 10: $n = 7/20$, 35%,
 - male: $n = 2/20$, 10%,
 - female: $n = 5/20$, 25%.

All transcripts were de-identified for analysis. Therefore, in the reporting of the results, the quotations from participants were attributed using the focus group number, followed by participant number in that focus group and the trimester they were enrolled in at the time of the interview. For example, FG1P2(8) refers to the second participant in focus group 1, who was enrolled in trimester 8.

Table 5.1*Student Participant Demographics*

Focus group	Participant)	Sex
FG1	FG1P1(8)	Male
	FG1P2(8)	Male
	FG1P3(8)	Female
	FG1P4(9)	Female
FG2	FG2P1(9)	Male
	FG2P2(9)	Male
	FG2P3(9)	Male
FG3	FG3P1(9)	Female
	FG3P2(9)	Male
	FG3P3(8)	Female
	FG3P4(8)	Female
FG4	FG4P1(10)	Male
	FG4P2(10)	Female
	FG4P3(9)	Male
	FG4P4(9)	Male
FG5	FG5P1(10)	Male
	FG5P2(10)	Female
	FG5P3(10)	Female
	FG5P4(10)	Female
	FG5P5(10)	Female

5.3. Focus Group Procedure

5.3.1. Focus Group Characteristics

Focus groups consisting of three to five participants. On average, the interviews lasted 60 minutes, and the interviewer attempted to ensure that all participants had the opportunity to respond.

The focus groups commenced with exploring participants' overall perceptions of the clinical program, followed by their perceptions of how well the clinical program prepared them for the professional environment and challenges encountered upon entering or during the clinical program.

5.3.2. Focus Group

Students enrolled in trimesters 8–10 in 2013 and trimesters 8–10 in 2015 were invited to discuss their views in five focus groups. Twenty-three topic guide questions were administered to the participant groups and are included in Appendix L. Table 5.2 summarises the intent and content of the topic guide questions. The alignment between the research questions and the indicative, semi-structured, open-ended focus group questions are presented in Table 2.

Table 5.2*Alignment Between Theory, Research Themes and Student Focus Group Questions*

Theory	Research themes	Focus group questions
ELT	The educational effect of clinical placements	What has been your perception of the clinical program and education provided?
ALT and social learning theory	The perceived value of the current clinical program	What are the strengths and positive attributes of the clinical program? What are the weaknesses/ deficiencies/ negative attributes of the clinical program?
SLT	The best practice in clinical education to develop clinical practice skills to be practice-ready	How do you think the clinical education of this program has prepared you for the professional environment?

Note. ELT- Experiential Learning Theory; ALT- Adult Learning Theory; SLT- Situated Learning Theory

5.4. Analytical Strategy

The study used focus group methodology and thematic analysis to address the research questions. Thematic analysis was conducted as a method for identifying, analysing

5.5. Findings

The details of the four main themes and six subthemes from the student focus groups are provided in Table 5.3. Themes 1–4 are presented as descriptive text, followed by direct, verbatim quotations from the student focus group participants. These quotations describe their perceptions and experiences related to what they did and did not value from their clinical program.

Table 5.3*Themes and Subthemes Derived from the Student Participant Data*

Themes	Subthemes	Subcategories
Clinical preparation	Preclinical preparation	
	Professional preparation	
Guided learning in clinic	Encouraged to reflect	
	Clinical placements	Trimester 7
		Trimesters 8–10
	Clinical supervision and mentorship	Trimester 7
		Trimesters 8–10
		Hub clinics' patient model Spoke clinics' patient model CE role modelling
	Feedback	Formal feedback
Informal feedback		
	IPE, IPL and IPP	
Business preparation		
Being evidence-based		

Note. IPE- Interprofessional Education; IPL- Interprofessional Learning; IPP-

Interprofessional Practice.

As noted in Chapter 4, many of the themes were consistent across the three types of participant groups (clinical faculty members, students and new graduates), and are represented in Chapter 7, Figure 7.1. The following themes, subthemes and analysis provide an exploration of the various perspectives from the voice of the student: what they did and

did not value, what they saw as a challenge and what contributed towards best practice. The results, analyses and discussion of the students' perspective are presented below.

5.6. Theme 1: Clinical Preparation

'Clinical preparation' was perceived as integral to the clinical program and an essential step towards students' graduate preparedness. Each student must undertake 1305 hours of clinical placement and outpatient hours to complete the clinical program. This equates to almost 30% of the 4560 hours for the entire DCP. Based on these figures, it would appear that students have an abundance of clinical hours and access to experiences. Several critical stages of preparedness were identified, which have been developed into subthemes: 'preclinical preparation' and 'professional preparation'.

The participants were complimentary in how they felt the program was preparing them, with one participant stating 'my perception of [name withheld] was one of the best in the country for the clinical, and I've been satisfied so far' (FG1P1(8)). From another participant:

It's been pretty thorough and makes sure that you're a competent chiropractor. And at least are able to diagnose appropriately and come up with a reasonable, logical plan of attack of how you want to treat patients. (FG1P2(8))

The following subthemes explored the various phases of preparation and the diverse perceptions of how they felt prepared for clinical placements and eventual practice during their progression through the program.

5.6.1. Subtheme 1: Preclinical Preparation

The preclinical phase of the program occurs up to the end of trimester 6. During this period in the curriculum, students have covered the basic sciences and some clinical sciences. The majority of participants felt they were prepared well during this phase regarding their acquisition of appropriate clinical and diagnostic skills. The specific preclinical units leading

into trimester 7, conducting patient assessments on their peers and clinical documentation in a laboratory setting, provided a good transition from the classroom to the clinical setting. Their preparation was apparent when they entered into the introductory component (trimester 7) of the clinical program:

From my perspective, they do do a pre-clinic, student clinic, atmosphere before we get to this clinic. What we were exposed to in the student clinic was the regular, healthy patients and then moving to a more advanced clinic or receive the general population. They did do an okay job preparing us for that. (FG2P2(9))

The participants felt well prepared in their clinical skills when they entered the introductory clinic. This clinic functions at a slower pace, only seeing a few patients with a gradual introduction to the processes, which did not seem overwhelming. The preceding trimester's classes brought together the required clinical and diagnostic skills of reviewing and performing these skills on peers as patients. Yet there were still some areas where they felt they were deficient:

I feel like I have all the knowledge, but I can't bring anything together ... well, it's important to, like, know orthopaedics and know about the disease and how it presents, but we're chiropractors and the whole, like, what we do, is treat it. The most important part I feel like I just didn't know how to do because I wasn't able to, like, put everything together. (FG4P4(9))

Integrating the various components of the clinical and diagnostic skills performed and collating the results into something clinically meaningful and applicable to their patient was where they felt most challenged. Despite mostly feeling prepared, students thought they wanted more experiential-learning encounters in the earlier stages of the program: "to have more clinical experience, maybe even the first trimester be in the clinic, be able to shadow, to see exactly what it leads up to" (FG2P1(9)).

When participants referred to ‘shadowing’, this meant engaging in observations of field practitioners while they are involved in their everyday practice. Having more of these experiences might have eased the transition from being a student to a ‘student clinician’:

We get it hit [sic], like sixth trimester, we’re not seeing the interaction, we don’t see the responsibility that as futures docs. We then really start seeing how everything that we learn here is applied; when I see that interaction that’s when we hit the sixth tri[mester] and then the seventh tri[mester] you’re, ‘Oh, I’m responsible for this’. (FG3P2(9))

The experiential learning did not necessarily need to be direct, ‘hands-on’ patient experience. Other experiences could be through clinical observation of fellow peers, more-senior students and field practitioners in their clinical engagements. Some students voluntarily elected to participate in further observations above the mandated requirements to assist with their clinical preparedness:

We don’t really get a lot of interaction; we don’t get to even really observe an interaction between doctors and patients until sixth tri[mester], like, I know personally, I just took it upon myself to shadow docs at home, in the field, yeah. (FG1P2(8))

By doing so, the theoretical component of the program started to become more relevant. This was an additional benefit of keeping students far more engaged and motivated in their learning: “yeah, just the light at the end of the tunnel after the hours and hours that you spent in the classroom, I think it would have been nice to see that earlier as well” (FG3P1(9)).

In conclusion, participants felt that the college had prepared them well in the preclinical phase of education: ‘I notice there’s the classes that we had before starting in clinic definitely correlate to what we’re doing on a regular basis here. I wish I could go back and take over those classes’ (FG2P1(9)). Furthermore:

Education leading up to the clinical experience ... clinical preparation, right, in terms of new patient visits and established patient visits, different treatment protocols for certain complaints, I believe we're super well prepared, especially when it comes to even ruling out any red flags, special diseases, systemic diseases, cancer and things like that. I don't think we're ever going to miss anything that's put in front of us. (FG5P1(10))

5.6.2. Subtheme 2: Professional Preparation

The next phase of the clinical curriculum is for professional preparation, designed to prepare students for their transition from chiropractic students to competent practitioners. In general, and similar to the theme 'preclinical preparation', the majority felt well prepared for their transition into practice. This did not vary between students in trimesters 8, 9 or 10.

A few trimester 8 participants felt less clinically prepared to transition to practice, which is understandable given they have two trimesters of learning. One participant, who had a health degree before entering the DCP, stated they were uncertain as to how the clinical program was preparing them for the professional environment:

I have been on a couple of rotations, and for most of what I've learned here, I've learned as an undergraduate in a Master's program. So I feel that I have more clinical experience, and I've been told that by one of the doctors that I have been underneath that compared to my Master's, which was as a physician's assistant. The clinical that we get here is ridiculous; it's not enough to notice a problem. (FG1P3(8))

A more positive perspective was expressed by another trimester 8 student who had experienced some time in a spoke clinic. The spoke clinic experience positively affected their sense of preparedness: "I feel pretty comfortable being able to start, you know, day one after graduation, and at least be able to, like, be on my own and be confident diagnosing and treating" (FG1P2(8)).

The trimester 9 students all seemed to feel well prepared for their transition to practice. This confidence in preparation became apparent when they made comparisons by shadowing practitioners in the field:

I think it's prepared very well, especially going out and shadowing different doctors all over the east coast. We can stand toe to toe with them. We might not be able to have the endurance of seeing x amount of patients every day, but that will come with time. For knowledge and for ability, we're right there. (FG2P3(9))

The trimester 10 students were unwavering in their clinical preparedness as they were approaching the final stages of the program: "I think we all know what we are doing, yes. You put us in a clinic; I think we would be able to treat patients and do it in a safe way and effective way" (FG5P5(10)).

As to whether participants felt they had attained sufficient clinical competence, all of the trimester 8 and majority of trimester 10 students appraised that they felt clinically competent. Only the trimester 9 participants were somewhat reserved and conservative in their appraisal of their attainment of clinical competence: "competency along the way has been increasing" (FG3P1(9)). With the exception of two students, one in trimester 9 and the other in trimester 10, the majority felt clinically competent. At the very minimum, they felt like they would be safe practitioners.

However, there were instances where students thought there could be improvements in their clinical preparation. For example, a slightly different perspective was offered by another final trimester participant: "there's been pros and cons to the entire experience. Some things I've loved, some things I've hated. Overall, I feel prepared upon graduation but absolutely think there's a bunch of things we could improve upon" (FG5P1(10)).

Several factors of the clinical program contributed to their clinical preparation. However, experiences in certain CLEs were not translating well towards their sense of

professional preparedness. This mostly related to the hub clinics. The three hub clinics are located either on the college campus or in nearby urban centres as a fee-for-service teaching clinic, seeing members of the public:

Now I'm in ninth tri[mester], and this is the third week of school; I've only seen two patients in the (hub clinic), and I don't know how it is in the tenth tri[mester], but I sort of feel like that hands-on experience is, for me, what I'm lacking. (FG4P3(9))

Having fewer patient interactions at the hub clinics was limiting their development of skills. The variation of clinical placements, having access to more hands-on time with patients and the patient complexity at the spoke facilities affected upon their professional preparedness:

The rotation I've been on is [community clinic], which is a free clinic, and it's a mix between, there's a migrant foreign-worker population and some Medicaid patients. It gets you really good life practice and sharpens your skills in taking histories and communicating. And you see some different things. (FG1P2(8))

Students eventually have the opportunity to rotate through the spoke clinical facilities. This is likely to accommodate some of the varied sentiments of feeling less prepared before having these rotations; students eventually felt prepared following spoke rotations.

Other factors contributing to their sense of professional preparedness related to the level of supervision provided by their CE and the students' autonomy: "I think now, the position I'm in now, I feel like I'm prepared to go out into the real world because of the fact that they've given me so much leeway with that kind of critical thinking" (FG2P2(9)).

There was a prominent sentiment from students that they needed to engage in supplementary learning to prepare them adequately for the profession. They did this by observing practitioners when they could find the time:

I think that was very useful. I went and shadowed a chiro I used to swap patients with to see what he was doing with my patients ... but to see how long he spent with people, I actually spent more time with his administrator to learn the software. And then I went and shadowed a teacher, which was interesting and to see how much interaction they have with their patients and whether they're very gregarious or not. (FG1P1(8))

The need to observe practitioners in the field was similar for their transition into the clinic. Experiential, social and situated learning through engagement with field practitioners was perceived as a valuable learning experience and a way to be introduced to the CoP for these soon-to-be practitioners. These opportunities seemed to connect the academic environment with the professional expectations for students.

In addition to practitioner observations, the need to engage in supplementary learning was to fill in some of the educational gaps of the program. This occurred mostly in the final trimester, where students felt deficient in specific chiropractic treatment techniques and underprepared in managing specialty populations, such as paediatric and pregnant patients. For this reason, they sought further education external to the institution:

There are a lot of seminars and it's great if you have the time and you can afford to go, but we are already paying almost \$200,000 to go to this school and yet they can't, like, say, oh here, go to this seminar because it's part of, you know, it could be included. So it is a little frustrating. (FG5P3(10))

They also felt they needed to gain additional certification in chiropractic techniques, to distinguish them from the average graduate and to appeal to prospective employers.

Even though participants mostly felt well prepared, this did not mean they had completed their learning journey:

There have been several doctors that I can think of that have said to me, 'if you think you're not going to be a lifelong student then you're wrong. And not only are you wrong but you're doing a disservice to your patients'. (FG5P2(10))

Overall, students' sense of preparedness provided mostly congruent responses. The different aspects of preparedness related to the stage of progression through the program. When students entered the introductory clinic, the majority of participants felt well prepared.

As students progressed, their sense of preparedness varied, depending on the CLE and the patients seen in these settings. This mostly related to the spoke sites. There was less variation in how prepared participants felt to enter the profession as they became closer to completing the program. To conclude, it is apparent that students felt competent in their clinical skills. They thought they had proper academic preparation and knowledge, and were satisfied with the clinical program. These perceptions contributed to their sense of competence and professional preparedness.

5.7. Theme 2: Guided Learning in Clinic

This theme identifies the various processes and initiatives that students experience and use to develop their clinical and professional competencies and capabilities to meet professional standards. This theme encompasses five subthemes (see Table 5.3); each considered individually important aspects that contributed to the students' learning and graduate preparedness.

5.7.1. Subtheme 1: Encouraged to Reflect

The first subtheme of 'guided learning in the clinic' is 'encouraged to reflect'. Reflective practice is the act of learning through and from experience to gain new insights of self and practice. For a professional, such as a chiropractor, reflection in action requires one to consciously review, describe, analyse and evaluate their past practice to gain insight to improve future practice (Finlay, 2008). Across all three trimesters, it was apparent that the

participants were generally unfamiliar with reflective practice: “I don’t know if we have been encouraged, but I guess I try to be reflective as often as I can, but no, we’re not” (FG1P1(8)). From another participant: “but I don’t think it’s really stressed here at school to develop that [reflective practice]” (FG5P4(10)).

One trimester 9 participant requested a definition and examples of reflective practice from the interviewer to help understand the concept. The participant questioned the concept and value of reflective practice, and there seemed to be a reluctance to participate in reflective practice. The same participant dismissed the practice as being encouraged; however, they also considered that student reflection might be dependent upon the patient they see:

I’d say, ‘Hey, some patient’s coming in, some patient or something really hard’, you’re going to come home and you’re going think about it. You are going to want to do better, you are going to want to help that person. (FG3P2(9))

From some participants’ facial expressions and their responses to this line of questioning, they seemed confused and generally had a limited understanding of what reflective practice means. Some related reflection only to their accomplishments in the clinic. One participant’s comment focused on how they managed their patients:

Yeah, we are. That’s part of our treatment plan. It’s always what’s the expiration of this [the treatment plan], whether it be this many treatments or this many weeks. It’s always do pre- and post-treatment analysis ... there’s always documentation of how the patient is progressing. So, that definitely forces that reflection ‘is this treatment working for the patient? What else needs to be modified at this point?’ So that’s [reflection] is built into the system. (FG2P2(9))

Only a small number of participants indicated they had a better understanding of reflective practice and seemed to engage in this actively: “where I want to improve? Where I

fell short with particular patients, or where I did good with particular patients? Absolutely” (FG5P2(10)).

Reflection needed to be an educator-driven initiative instead of being a student-driven one. The lack of time or opportunity to engage in real-time reflection in the clinical setting meant that it would need to happen later when debriefing with their mentors: “I feel like the mentor meetings that we have ... we have a couple every ... those would be some opportunities to either be more reflective” (FG2P3(9)).

The student–CE mentoring sessions were perceived as a lost opportunity for the CE to drive student reflection. The cathartic nature of reflection between students and their CE mentors was considered a substantial opportunity to improve upon the students’ practice in a formalised way.

According to one participant, the doctor-driven model, where the CE directs and drives patient care, seemed to hinder students’ reflection on their practice. This is likely because the CE (doctor) formulates concepts, decisions and approaches to assessment and management. For instance:

I think that some people are like naturally reflective, writing a journal or, like, just stressing out about it and some people aren't, and I think they're not really encouraged to because either the treatment plan's already established or you're at a rotation where you're not going to be back enough times that it's really valuable ... but I don't think it's really stressed here at school to develop that. (FG4P4(9))

Limited autonomy and decision-making in the care of patients did not encourage students’ reflective practice. This was because their CE were making decisions, not them, so they did not need to reflect upon their skills and performance. Also, continuity in treating a patient for a longer period and seeing them complete a treatment plan was limited, thereby reducing the likelihood that students would reflect on their practice. This was understandable

when they could not complete the treatment cycle, from the patient examination, management plan and treatment to then observing the patient's outcomes and response to treatment.

Despite reflection not being a part of their everyday practice, participants perceived that this does occur organically. The act of being reflective is more inherent to the individual, such that the practice does not need to be encouraged or directed:

I would say that the people I've met in chiropractic college, the majority of them are introspective people. So, from that sense, it's not actually mandated because a lot of us are already that way. I'm overly analytical myself, so nobody will ever have to tell me to analyse.
(FG2P1(9))

One participant from focus group 2 suggested—and others readily agreed—that the lack of reflective practice could create opportunities for a student-driven initiative. Reflecting on practice, this participant asked:

Does it have to be mandatory? Because, easily, the three of us could leave this room and start that process with the younger trimester students, gather in a group and say, 'What did you do good this week? What did you think you need to improve on?' Just facilitating a process without the clinicians. (FG2P1(9))

This illustrates the added value of a student-driven reflection exercise with peer mentoring of students.

Overall, the participants were unsure whether reflective practice was a part of the regular curricula or even a part of the clinical program. The majority felt it was more of a personality trait or inherent to the individual, which could not be directed or integrated as a required learning component. Despite this, most were open to the concept and appreciated that it would lead to a patient-centred versus a doctor-centred clinical approach. What might encourage more reflective practice would be students engaging in reflective dialogue through discussions and mentoring as a student-driven initiative that does not need to be a

requirement or incentive of the program. The student and clinical mentor meetings throughout the trimester could also encourage this practice by asking students some open-ended questions instead of being task-based feedback sessions. Students feeling more responsible for their decisions in providing patient care may also support this practice. This was an area of the clinical program in need of improvement.

5.7.2. Subtheme 2: Clinical Placements

The second subtheme under ‘guided learning in clinic’ was ‘clinical placements’. As presented in Chapters 3 and 4, the clinical model consists of an extensive program of clinical placements. Students commence in the introductory clinic in trimester 7 and then graduate into the hub and spoke outpatient clinics in trimesters 8–10. The student data have been presented according to the different clinics.

5.7.2.1. Subcategory (a): Trimester 7 Clinic

As previously stated, trimester 7 students were not included as a participant cohort in this study. Instead, participants in trimesters 8–10 reflected upon their clinical placement in trimester 7.

Students’ initial clinical experience is in the introductory on-campus clinic. This clinic seems to provide an appropriate transition for students for several reasons: (a) there is a graduated and scaffolded approach to clinical supervision and mentoring during this trimester; (b) the interaction between students and CE includes more intense guidance, supervision, hands-on interaction, demonstration, feedback and mentoring; and (c) the patients tend to be less complex.

The students are divided into pods for the trimester, where they are under one dedicated CE for patient supervision and mentoring. In their initial patient interactions, a senior intern is also assigned to the trimester 7 students. They perform and oversee patient interactions as part of a team model. The patients who attend this clinic are of a more familiar

demographic—mostly student peers who also tend to be less complex patients. The clinical processes are highly structured, with patient engagements overseen by clinical supervisors and senior trimester peer mentors. The clinical framework appears as a purposely scaffolded program with tiered approaches for clinical processes, patient cohort and supervision.

Participants mostly found the introductory clinic to be a good place to transition from student to clinical intern:

We start our clinical experience in our seventh trimester treating ourselves or other students in clinic and then we move on to students in other trimesters, and the administration and staff over at the campus health centre. So, I feel like we've had a good amount of exposure to working, kind of, in the clinical setting and actually going through with each appointment before we start over here at the [hub clinic], and then on rotation ... if we were just thrown in over here beginning in the seventh tri[mester], we wouldn't be nearly as prepared as we are now. (FG1P2(8))

As described above, the scaffolded approach was a positive aspect of this clinic that supported students' easy transition. As stated by a trimester 8 student:

I guess that whole having the transition because our first patients were healthy students so it was very rare that you would get into a room with a patient and not have any idea what's going on with that patient. So, I guess that helps, kind of, getting confidence being alone with a patient and then when you got up to the different rotations, you've got a bit more comfortable assessing and diagnosis and treatment. (FG1P2(8))

As the introductory clinic is located on the main college campus and provides care to students and employees of the college, this limits the patient population. Yet there is merit in students seeing the less complex patient in the earlier stages of their clinical program when they are rapidly developing their technical and non-technical skills with a familiar patient

type and population. Despite the limited case mix, students felt that their CE supplemented their learning with their clinical anecdotes and case-based learning.

5.7.2.2. Subcategory (b): Trimesters 8–10 Clinical

Placement

After trimester 7, all processes and placement types change as students move into trimester 8. During trimesters 8–10, students graduate into the ‘regular outpatient’ clinics of the hub and spoke clinics. In addition to the hub and spoke placements, students may apply for competitive remote internships. Internships occur at nine clinical facilities, including hospitals, VA clinical facilities, DOD clinical facilities and a range of private multidisciplinary clinical facilities. None of the study participants engaged in a competitive internship; hence, there was nothing to report on these external clinical placements.

The longitudinal scaffolded program allows for their preparedness to be staged through their clinical placements. Students commence at the hub clinics initially, then rotate into the spoke clinics for short-term placements with a minimum of a four-week placement. Due to the staged nature of the different clinical placements, they could build upon their skillset in the hub clinics, before moving into the spoke clinics. The level and model of supervision also evolved with each of these transitions in clinical placement. In other words: *Also they held our hands in the beginning and walked us through the whole process, to make sure we understood how it worked. Then, as they get comfortable with you, they allow you more and more leeway to develop your own clinical experience.* (FG1P2(8))

The diversity of the clinical placements in the hub and spoke clinics were predominantly referred to as the strength of the clinical program. The spoke clinics, in particular, were highly appraised: “clinical rotations were productive, yes, loved them. They were great; the VA rotations were great; our free-care site rotations were great” (FG5P1(10)). This was for many reasons, such as: “but you see real people. They’re really in pain; it’s not a

student faking pain and especially like the VA, the stuff that they've been through. That's just real, one-on-one talking with a person" (FG5P5(10)).

At all of the aforementioned clinical sites, students see members of the general public. These clinics tend towards a more varied patient case mix and demographic. When they progressed into the hub and spoke clinics, the students acknowledged that they had greater exposure to more varied patient populations. Students valued these diverse clinics for that reason: "I think, maybe just the quantity of those types of cases, there is more of a chance that we'll be working with one of them, to having a kind of diverse enough population that we're set up in" (FG2P3(9)).

Participants made some direct comparisons between the hub and spoke clinics, where the hub clinics provide a relatively generic or homogenous patient population: "I haven't been here for very long [hub clinic], but I've only seen the routine, you know, "chiropractic patient". The lower back and neck pain. There's not much else going on" (FG1P2(8)).

Students also appreciated the 'real-life' challenges of the spoke clinics: 'at the VA, you have to, like, actually diagnose the person and make a treatment and write up a new patient like an office thing, and it's just a very different environment altogether' (FG4P4(9)).

Another participant offered:

The people from the community that just come in we get those here, but everybody else just seems to be in dire straits and so we get the ones that really need us. Which is a good feeling from a rotation. (FG1P1(8))

When students stepped into the spoke clinics, they would usually see a more genuine patient in need of care, a varied patient mix and patient complexity not seen in the on-campus or hub clinics. From the varying clinical placements, it seems that by the end of the program: "even with the minimal, like, patient encounters we have, out of the 250 we get a good variation of [patient] presentation" (FG5P1(10)).

Participants valued having access to the varied case mix facilitated by a variety of clinical placements. However, they could recall certain patient populations with which they had limited experience within their clinical learning: “not so much the younger age group, more about early 20 to late 20s up into the 80s’ (FG2P1(9)) and ‘mine’s been the same, I haven’t treated any children or infants” (FG2P3(9)).

Of all participants, only one could recall seeing a pregnant patient; the same finding was true for the paediatric population. Hence, participants had minimal hands-on experience with specific specialty patient populations.

Generally, participants from all included trimesters had praise for the quality of the experience in the spoke clinics. However, this was not necessarily the case for the hub clinics, for the following reasons:

But the use of the time, you know, most of the time that I’m here, I’m just sitting around waiting and, like, I count the days ‘til I get to go on another [spoke] rotation and I get to see more patients and utilise our time a little better. You know, one of the reasons why I applied for some of those externships and stuff so that I can get out of here so that while I’m supposed to be learning I’m actually hands-on with patients and not just waiting for the patients to come in. (FG1P2(8))

All hub clinics are fee-for-service clinics located in urban areas. These clinics have fewer patients attend in comparison to the spoke clinics. As a result, students often had far fewer patient interactions on an average day, or sometimes none at all. They would attempt to fill their days with additional assignments, tasks or sometimes even playing cards. For this reason, students reported a mostly poor experience and perception of this placement.

Nevertheless, the hub clinics were an appropriate step into the outpatient environment. When students transitioned onto the spoke clinical placements, it was then that they started to experience a real and meaningful clinical experience, and got their ‘hands

dirty'. The more challenging experiences in the spoke clinical settings assisted in their sense of graduate preparedness. The complexity of the patient and students' engagement with varied patients was perceived as a crucial factor that was instrumental in developing students' clinical and professional skills. Beginning with routine patient presentations and progressing to more complex patients in the transition to graduation was viewed favourably. The variation in clinical encounters offered by the number of diverse clinical placements was a positive experience and strength of the program.

5.7.3. Subtheme 3: Clinical Supervision and Mentorship

The third subtheme of 'guided learning during clinic' is 'clinical supervision and mentorship'. At this institution, each clinical site—whether it be the introductory, hub or spoke site—has a supervisor-to-student ratio that can be either (a) multiple students to one clinician or (b) multiple students to multiple clinicians. The exact ratios of students to supervisors are not known. Each student has anywhere from five to seven clinical placements, which means they encounter various CE across the program.

The level of guidance and mentorship provided by CE depends on the student cohort for which they are responsible, that is, the trimester 7 students at the introductory clinic or the trimesters 8–10 students at the hub and spoke clinics. Variation in supervision would also depend on the clinical governance of the clinical facility. The model of clinical supervision, according to Dent (2005), has been categorised according to the student-to-clinician ratios seen in each trimester (see Table 5.4).

Table 5.4*Clinical Supervision Model According to Clinical Setting and Trimester*

Trimester, clinical setting	Student-to-clinician ratio	Supervisory model ^a
Trimester 7 introductory clinic	Multiple students to one clinician, and one student to one senior peer	Sitting-in model (with the near-peer mentor) Apprenticeship model Report-back model Tutor model
Trimesters 8–10, hub clinics	Multiple students to multiple clinicians	Team member model Sitting-in model (modified) Report-back model
Trimesters 8–10, spoke clinics		Report-back model Supervising model Team member model

^a Supervisory model from Dent (2005).

5.7.3.1. Subcategory (a): Trimester 7—Models of Supervision

During the trimester 7 introductory clinic, groups of students have a dedicated CE. These CE are responsible for the supervision of students engaged in the care of patients consisting of students and staff of the institution and serve as clinical mentors to students. For the entire trimester, the students have only one CE assigned to them.

The adopted clinical model within the introductory clinic aligns with Dent’s ‘report-back model’, whereby “students may interview and examine patients independently or in pairs before reporting back to the clinician on their consultation and discussing the proposed

management” (Dent, 2005, p. 308). This is a relatively slow-paced clinic where senior students and CE oversee and mentor students in providing patient care. Students are also engaged in supplemental learning through scheduled tutorials with their CE.

Evidence of a mentorship framework is in place so that trimester 7 students are under the instruction, guidance and mentorship of one specifically assigned clinician. This arrangement appears to be most valued by participants during this trimester. Yet there were also some perceived drawbacks of this approach, such as having too narrow a scope or perspective if only exposed to one CE:

Even in the seventh tri[mester], getting to see different clinicians will help see different ideas and how people practice differently and each person’s different, like, ideas on what should be done and how it should be done, and just getting, like, different perspectives on things.

(FG1P2(8))

Senior students from trimester 8 onwards are engaged in the introductory clinic, serving as a clinical mentor involved in team-based, co-treatment of patients with trimester 7 students. This provides another level of supervision and mentoring for the novice through a near-peer arrangement. The combination of CE and near-peer supervision and mentoring during trimester 7 provides a unique model that is highly structured and with higher dependency.

5.7.3.2. Subcategory (b): Trimesters 8–10—Models of Supervision

The students then move into the hub and spoke clinics for the remainder of the clinical program. The multiple students to multiple clinicians supervisory model is typical at each hub clinic, and either the multiple students to one clinician or the multiple students to multiple clinicians model is typical at the spoke clinics. As each student rotates between

clinics every trimester, they inherently undergo supervision from multiple CE at each site in each trimester.

Disadvantages of the trimester 7 supervision model became apparent when students were exposed to the opinions and viewpoints of one CE for the entirety of the previous trimester. The variation in expectations of different CE became evident when they moved onto the different model. One trimester 9 participant recalls this experience:

Just figuring out which clinician wants the paperwork done a different way. It was frustrating ... definitely some clinicians are looking for other things more than, each clinician kind of have an idea of what they want from you and so learning who you're dealing with and adjusting your protocol or whatever to each clinician as you're going through, you know, that's just one little hurdle. (FG1P1(9))

The multiple students to multiple clinicians model can provide challenges when CE have their own specific and individualised approaches, as alluded to in the preceding quotation. Maintaining consistency can prove difficult across multiple educators. Understandably, students can feel conflicted and challenged. Students' frustration with inconsistent expectations among CE was prevalent, which can be detrimental to students' learning. That said, CE diversity can be both a strength and a weakness.

At some of the smaller clinical sites, there are fewer clinicians. Students found that this seemed to provide a more consistent approach between the supervisors and minimised confusion.

There were some further differences between the hub and spoke clinics regarding supervisory models. These have been grouped and the analysis are presented.

5.7.3.3. Subcategory (c): Hub Clinics' Supervising

Model

Each student attends one of the three hub clinic placements during trimesters 8–10. These clinics use the multiple students to multiple clinicians model of supervision. The adopted model of patient care is the doctor-driven model. In this case, the ‘doctor’ is the CE. The supervision type does not appear to be completely congruent with Dent’s (2005) supervisory models, but would be considered a combination of the team member model, where the more senior student interviews and examines patients before either being visited by or reporting back to the clinician, and the supervising model, where the more experienced student conducts an entire interview and examines the patient in independent rooms with only limited tutor supervision (Dent, 2005).

In the doctor-driven model, the patients are assigned to a chiropractic CE (doctor), who then appoints a student to a patient visit. It was unclear whether the same student is consistently assigned to a patient, or if this could be any student who is present.

In the team member model, the CE/doctor and student are engaged as a team in a patient consultation. The CE performs certain aspects of history-taking, assessment and management, and others tasks are performed by the student (Dent, 2005). This approach appears to be necessary at the hub clinics due to the requirement of accepting patients’ private health insurance for service. If the patient presents for care utilising their insurance, then the CE must manage and deliver services billable under their provider number for the primary complaint. Students liked the team aspect but also found it constraining. For instance, one participant stated, ‘because once you’re treating real patients and going through insurance, your hands are tied in a lot of ways’ (FG5P4(10)). Another participant provided a similar opinion:

You're kind of just forced into doing exactly what the doctor wants. And I'm not saying it's bad, I do like how our clinicians are very like patient-centred and I understand they're looking for the best quality of care for their patients, and I think that's good, and definitely, there's a lot to learn from, I just like a little more freedom when we're able to have that.

(FG5P3(10))

Overwhelmingly, the doctor-driven model was perceived by students as less than optimal for their learning. This model provided limited autonomy and was perceived to affect their attainment of clinical skills. When students wished to evaluate or amend patient care and management critically, they felt they lacked the opportunity. The interactions between student and CE seemed to resemble direct modelling to the extent that some students felt inhibited. However, despite their frustrations with this model, there still seemed to be a positive learning experience:

I would say even though my hands were tied, I still had valuable experience from that because I was afforded the opportunity to go and question the doctor and get their 35 years or 10 years or however long experience and so it gave me ways to think that outside of a classroom I was never given. (FG5P2(10))

The hub clinics afforded fewer freedoms and responsibilities to students, as these facilities accepted insurance patients for specific CE, with specific rules and compliance requirements. The doctor-driven model was understood as a necessity for compliance reasons. However, this doctor-driven approach was more appreciated by students when it was applied in graduated steps. When students felt that they could contribute sufficiently and more independently towards patient care, they appreciated it even more.

5.7.3.4. Subcategory (d): Spoke Clinics' Supervising

Model

The spoke clinics appeared to have another type of clinical model, despite claiming to use the doctor-driven model. The difference reported by participants related to their level of autonomy in providing patient care. Students were allowed to contribute more independently in the care of patients from history-taking, assessment, treatment, critical thinking and decision-making for patient management. This description would reflect two of Dent's (2005) particular models:

Team model, supervising model and report-back model involve students interviewing and examining patients before reporting back to the clinician on their consultation and discussing the proposed management (which may be outside of the consultation room) (Dent, 2005).

Because of this increased autonomy, students reported a far more positive experience on these placements:

So like I went to [spoke clinic] and I had a lot more freedom when I was there. And at [spoke clinic], I was at a free clinic and I got a lot more freedom there, which was nice. Like, we take in a lot of electives and things and it's nice to be able to try and put I some of the things that you've learned. (FG5P2(10))

Not all spoke sites seemed to allow the students equal autonomy, possibly because of the variation of clinical sites and CE. One participant recounted:

On rotations and here, the [spoke clinic], you follow the treatment plan that was already established. Nine out of 10 times, you aren't examining the patient, you aren't taking initial, like, case presentation history, it's already written up for you on the EHR what you have to do and you're forced to stick to it. (FG5P1(10))

It is difficult to determine why these variations in autonomy exist. Such differences may be due to the preference of approach of the CE, the governance of the clinical facility or a lack of understanding of what is required by the student and CE. With so many CE and clinical sites, inconsistency seemed a commonality and expectation. Contradictory opinions and approaches were confusing and problematic for students, clinicians and patients. However, the spoke clinical experiences were appraised in a more positive light from students because they provided greater opportunities for critical thinking and engagement in patient care.

5.7.3.5. Subcategory (e): Clinical Educator Role

Modelling

Students mentioned that how the CE behaved and performed in their roles was a strength of the clinical program. What participants particularly appreciated was the input of more-experienced clinicians with years of professional clinical practice:

I will say it has been an asset to see the different clinical years of experience with the clinicians, to not only have a clinician who has 20 plus years' experience in the teaching field as well as practising for 10 years, practitioner for five years. (FG2P1(9))

Additional teaching tools and clinical pearls provide by the CE could further add to the students' learning experience. Students value the real-life practice experience of their CE; their clinical narratives and field anecdotes enhanced students' clinical learning. The younger, more-junior CE were not as equally respected due to their relative lack of clinical experience. There may be inherent prejudices from students or merit in this; less-experienced CE have fewer clinical exposures, clinical pearls and anecdotes that they can offer to enhance students' learning. As well, the maturity required to be an educator may be somewhat lacking with less-experienced CE, but there is no confirmation of whether this was the scenario.

Additionally, the positive attributes of CE were more often associated with CE from spoke clinics. A student in trimester 9 recounted their experience in the spoke clinic, as follows: *I've been to the [community clinic] and I've been to [hospital], and I start at the VA next week. So at both of those I believe, and they are all under docs who are very qualified, and they're very, very helpful in their clinical experience, and if you have questions, they always answer them.* (FG4P3(9))

Students appreciated those who resembled a good chiropractor in the field, an 'exemplar' who they could learn from and model themselves on.

The CE that encouraged students to think and appraise critically, guide but not direct or insist, were valued. They were also far more appreciative of those that were interested in their opinions and allowed for autonomy.

The various roles of the CE are essential in enforcing a patient-centred care approach under the auspices of a teaching and learning student environment. Providing a student-centred learning environment and patient-centred healthcare delivery can be a delicate balancing act. What participants valued most was the student-centred mentoring provided by their CE. As one student commented:

And I've been fortunate with every doctor that I've worked with and I've told them how I want to be a chiropractor and they've gone out of their way to give me hints on how to be, how I want to be as a doctor ... they pull me aside and say, ok, well, while you are here at [spoke clinic] and every day for four weeks I got to practise upper cervical and the doctor was completely okay with that and he kind of nurtured me and this is how I would do it. He was exceptional. (FG1P3(8))

Participants were aware of the many competing demands of CE in their roles; their responsibilities in supervising, educating, facilitating, overseeing and engaging in the care of patients. Educators possessed specific attributes that enhanced students' learning experiences,

for example, their interactions in providing patient care, critical thinking and mentoring. Educators who were highly regarded by students were those who were open to having differing opinions, mentoring students and having high standards and expectations. Overall, CE were mostly perceived as a positive aspect of the clinical program. Their diversity, mentorship, high standards and exemplary modelling of behaviours in the clinics were noted and valued. The diversity of their perspectives was both a strength and a weakness. They could provide various viewpoints and opinions, and challenge students with this diversity. All of these factors potentially contributed to enhancing students' clinical preparedness for practice.

5.7.4. Subtheme 4: Feedback

The fourth subtheme under 'guided clinical learning' is 'feedback'. Feedback is integral to students' development and attainment of clinical and professional skills. Further to the participants' desire for clinical mentoring, they also desired to engage in real and meaningful feedback with their CE. There appeared to be many mechanisms by which feedback was provided, through formal and informal means.

5.7.4.1. Subcategory (a): Formal Feedback

There are several ways that students and CE engage in formalised feedback. During the trimester, CE engage in formal observations, assess students on their patient interactions and place these assessment rubrics online for future reference. Scheduled feedback sessions occur between students and designated clinical mentors at regular, planned intervals each trimester in weeks five, 10 and 15. For these sessions, clinical mentors review the rubrics; the students' progress towards meeting their quantitative requirements, or 'patient quotas'; and the case mix. The question of whether the students perceived these sessions as valuable was met with varying responses: "useless, absolutely useless!" (FG1P1(8)). And from another student:

Right now they [clinical mentors] get a form in front of them and they say, 'You need this, this and this. Here's the quantitative numbers, here's the qualitative and this is what you have to get by the end of the tri[mester]. We'll keep track of it and, by the way, you've been doing okay. Sign the form and you're done'. That's an exaggeration, because I'm sure other people have different experiences than that. (FG2P1(9))

The perception was that these feedback sessions provided mostly superficial feedback and detracted from the real mentorship opportunities that could be undertaken during formalised feedback sessions.

Formalised feedback from CE would assess students on patient interactions, such as history-taking, examining and treating the patient. These qualitative formative assessments were available for instantaneous feedback and were stored in the online portal for the clinical mentor and students to refer to at the formalised feedback meetings. The mentor meetings were for students to reflect on their assessments and to review their progress. Another important aspect of formalised feedback related to how it was delivered by the CE:

They don't give you, say, negative feedback in front of the patient. They'll wait until you're outside room and they don't do it in a derogatory [way]—just like, 'hey, you could have done this better, let's work on this'. I think they do a good job of that. (FG5P5(10))

CE seemed to have sensitivity in how they provided critical feedback. This meant that they would preserve the clinical experience and not compromise the student and patient interactions. However, not all were as equally skilled in their delivery of feedback:

There's one clinician at the [named clinic] who, we'll not mention names, but I think that he could go about things in a much more respectful manner and treat us as equals and not inferiors. We'll leave it at that. (FG5P5(10))

5.7.4.2. Subcategory (b): Informal Feedback

Though formalised feedback was a required component of the clinically based units, there was also informal, or ad hoc, feedback. The informal feedback was customarily given to students during their day-to-day patient interactions. This feedback was not associated with any assessment requirement but was more contemporaneously conducted in real-time to improve students' patient care as well as for patient safety.

Students regarded informal feedback as more valuable than formalised feedback. There appeared to be some variation in the frequency of this feedback as students progressed through the various trimesters. In the later trimesters, students noticed a reduction in informal feedback from their CE. The variable nature of feedback in trimester 8 is evidenced by two participants. The first participant stated "I think that it's, you know, as we move on in our education it's been declining" (FG1P1(8)). From the second participant, "we do all our rotations with other people and they haven't even watched it sometimes. "Am I doing this right? Does this look good?" So, they don't do it anymore, I'm given no feedback" (FG1P3(8)).

There could be a reason for this:

At this point, I feel like they're confident in what I'm doing and then it's just like catch me at, well, little snapshots of what I'm doing, so they can't give any feedback from that. I can't think of the last time that I got feedback. You know, it hasn't been in the last couple of weeks, I don't think. (FG1P2(8))

Despite some of these challenges, participants felt that CE would be available for feedback if requested. However, some thought that they had to solicit feedback: "it depends on the clinician, but I think overall, as we've progressed through the program, it's gone down, unless you specifically seek them out. It's usually "oh yeah, you're doing great" (FG25128P2(8))

The reduction in informal feedback may be due to the less-intense supervision required of students as they progressed, creating fewer feedback opportunities. Also, this may be the result of the many competing demands placed upon the CE: “I think it’s more of a time aspect than anything else. There are only so many hours in a day. They have to treat, they have to give feedback and they have to do everything else, paperwork and stuff” (FG2P1(9)).

A noticeable change was especially the case when there were larger student cohorts in the clinic. Naturally, these increased demands altered the clinician’s ability to provide exclusive and timely feedback and mentoring. The opposite could occur with smaller student cohorts: “we’re from a small class, and there was, like, those periods of times where it was just really us here, and we got feedback. We got everything thrown at us, type thing” (FG2P1(9)).

Some even questioned whether the clinicians were providing ‘genuine’ feedback (FG1P3(8)). While it is unfortunate that some felt there was such a lack of feedback, there is a counter-argument that, in some instances, the more capable students may receive less feedback. There were some inconsistencies in the feedback provided, which may also be attributed to the diversity of CE who were tasked with providing feedback. The quantity of formal feedback seemed consistent, but the amount of informal feedback tended to vary, or mostly reduce, as students progressed. Participants greatly valued and appreciated feedback on their skills and development. There was always a desire for more feedback. The formalised feedback sessions seemed to miss the mark as genuine feedback and mentoring engagements.

5.7.5. Subtheme 5: Interprofessional Education, Interprofessional Learning and Interprofessional Practice

Another important aspect of the students’ ‘guided clinical learning’ was the subtheme of being interprofessional. The accepted definition of IPE, according to The Centre for the

Advancement of Interprofessional Education (CAIPE, 2002), is “when two or more professions learn with, from and about each other to improve the quality of patient care” (Barr, 2002, p. 17). The goal of providing students with IPE is to carry those acquired skills and knowledge into future practice (Buring et al., 2009), referred to as IPP or post-licensure practice.

This program has provided chiropractic clinical education alongside other health professions across the various hub and spoke clinics. At the campus health clinic, health professions include massage therapy, nutrition and oriental medicine. The spoke clinical rotations—situated within community health clinics and hospitals—house other health professions, such as medicine, dentistry, nursing and allied health. The institution website states they have an integrative clinical approach in their program. Despite these proclamations, participants had mixed responses and impressions about their level of IPE, IPL and IPP as a part of their clinical program. There was an acknowledgment that students mostly received a low-level interprofessional experience, with only a few interactions among the various health disciplines within the same facility. Even in trimester 8, this missed opportunity was something the students noticed. For example, ‘I don’t feel that there is very much interdisciplinary, and I know they’re multiple disciplines within this building’ (FG3P3(8)).

The same sentiments were expressed by a participant in trimester 10, who alluded that despite there being the presence of other health professions, there remained a highly segregated culture among the students and CE:

The students aren’t, like, co-mingling and the clinicians aren’t co-mingling, the professors aren’t talking and acupuncture feels like a second-rate citizen, and it’s too bad because there’s really—we’re trying to find a way so that patients can get chiropractic and

acupuncture in the same appointment but there's a bajillion roadblocks and it's too bad because they're such great opportunities there. (FG5P4(10))

Interestingly, some participants felt that an interprofessional approach might even detract from the student experience: “we have an intern program with acupuncture as well for the school. So it's hard to get multiple interns in the same room. They don't want to take away from the other interns' experience” (FG2P1(9)).

While some interprofessional experiences, such as observations, may be of benefit, there were no formal arrangements to encourage this. In addition, formalised and direct patient referrals to the other health disciplines within this hub facility were not commonplace. Participants provided several anecdotes of engagements in the hospital and VA settings, such as: “we see the records that have been written [by other health professionals]” (FG1P4(9)).

When it came to some of the hub clinics where there were no other health professions, students engaged in IPP through direct written referrals. These referrals occurred if the patient presentation was out of their scope of practice, needed further investigations or warranted co-management. What was unfortunate about this was that written correspondence to medical practitioners was mostly unidirectional communication: ‘you might not get any information back’ (FG2P2(9)).

There appeared to be more opportunities for IPL and IPP when moving into the spoke facilities such as the hospitals, VA facilities and outreach clinics. Yet some felt there was still limited engagement:

[in the VA] we're just in a little section, but I, just my experience that it does have chiro, there's one dermatologist and, like, one podiatrist, like down the hall; we don't shadow them or see what they're doing or. I mean, there's other settings that are hospitals, so maybe there it's different? (FG3P3(8))

However, there was a perception of a lack of support from the institution towards having more interprofessional engagements:

I think we would all choose to do that, but we don't have the opportunity. It's not, like, encouraged. And I don't even think if I asked tomorrow 'can I sit in on an acupuncture [appointment]?', I don't think they'd let me. Maybe. (FG3P1(8))

Despite a lack of formal interprofessional arrangements, one participant acknowledged they created their own. This interprofessional opportunity was most likely available because of being in the hospital, where this culture is more widely accepted:

On the rotations that I've been, if there is no patient, you go up to the medical doctor, and you tell him you're ready for grand rounds. And then they take you with them, and they teach because that's how it works in the medical community. You just go up to the doctor and say 'I'm ready for grand rounds' ... so if you're in orthopaedics, you may want to follow the surgeon and ask for the grand round, and you're going to view 20 patients in one hour, and it's just really good. (FG1P3(8))

This participant had a background as a physician's assistant, and felt quite confident in pursuing these opportunities. Other participants felt it was necessary to seek IPP experiences outside the institution and the clinical program, to develop their learning and understanding of other professions:

I think I, and I've been trying to maybe make some connection to go shadow, like, an orthopaedic surgeon or a neurosurgeon just to kind of see what they do because I feel like I'm not, I don't know, like, the nuances exactly who to refer to for what issues. (FG3P3(8))

Participants were overwhelmingly affirmative in their desire to be more interprofessional in the clinics. Having more interprofessional opportunities and exposures would assist in their learning of and about other health professions: 'yeah, a little bit more would be nice, so that you could explain to a patient what the other person does' (FG2P2(9)).

This lack of IPL was affecting clinical management of patients—they could not refer appropriately if they had limited understanding of how other professions might be able to assist the patient.

The downside to the lack of IPP and IPL was a tendency towards professional prejudices and biases. Participants expressed that this mostly occurred between similar and competing professions, such as chiropractic and physiotherapy. A better IPP experience could potentially improve these relations.

However, across all focus groups, it was apparent that students had a strong professional identity, which may further encourage them to engage with other health professions: “I feel like I can hold my own in some. Be a good representation of my profession to someone who’s not in it” (FG3P(9)). While it was promising that participants demonstrated strong professional identity, it was unfortunate that they perceived interprofessional engagements were likely to be confrontational.

When asked more specifically about whether students felt competent to engage in interprofessional clinical practice as a graduate, not all could respond with a definitive answer. While there were a number that did not respond, those who did were very positive about incorporating interprofessional engagements as a professional: “absolutely. Almost every patient I have—hopefully” (FG2P1(9)).

The participants who had interprofessional experiences as a part of their clinical program felt competent but still desired more practical experiences. The minority who questioned their competence for future IPP believed that this was the case because they did not know enough about other professions.

Overall, there did seem to be sparse IPL and participants had a poor understanding of other professions. Yet, there seemed to be a willingness and positive attitude towards being

interprofessional. Some saw it as critical to knowing their professional limitations and scope of practice, and a necessary part of person-centred care:

All the people we have to work with, physical therapist, occupational therapists, doctors, surgeons and for the best care of the patient. They need a well-rounded treatment. I still believe that chiropractic works and it's going to be the best treatment for a patient, but that doesn't mean that they can't have other treatments as well. (FG1P3(8))

Aside from the person-centred care aspect, IPP encouraged referrals and networking opportunities. If chiropractic students can learn about what they do, then they can equally learn about what chiropractic does, and perhaps be more open and accepting of the profession.

There seemed to be a willingness to be interprofessional with those professions with which students were already familiar: “there is a massage therapist who I’m friends with who I would love to go in business too” (FG3P3(8)). Conversely, a lack of existing connections was seen as an obstacle to future practice:

I would go into business with an MD; it would have to, if they could contribute something to make a difference, but I guess it would just depend on if the opportunity arose and if I made those connections. As of right now, I don't have them. (FG3P3(9))

Some final trimester students had an ideal concept for IPP. One said:

And upon graduation I am going to be—we're incorporating MDs, acupuncturist, PTs, everything into our office. Myself and another chiropractor will be operating as the head and clinical directors and we'll serve as the primary point of care for our clinic. So yes, I like the fact that if I do see anything, like, I'll have my team of doctors to help me in all different professions. (FG5P1(10))

Overall, there appeared to be limited experience in being interprofessional, which was also highly dependent upon the types of student clinical placements. Some variations were

dependent upon whether they were placed at a hub clinic or a hospital. Each clinical site had a unique interprofessional culture, yet were mostly informal, despite there being an opportunity for more formalised arrangements. The participants' interprofessional experiences were of a relatively low level, through written patient referrals and sharing of electronic clinical records. Their exposure to examples of higher level IPP appeared to be minimal. Despite this, students seemed to be enthusiastic and desired further and more-coordinated interprofessional experiences as a part of the clinical program, and then as a professional.

5.8. Theme 3: Business Preparation

Another dominant theme that emerged across the majority of focus groups was 'business preparation'. In the focus groups, there were no specific questions related to the business aspects of chiropractic practice. But students' thoughts emerged from inquiries related to a) the extent to which students felt competent about independent practice as a new graduate, and b) their perception of the weaknesses of the clinical program.

Business courses are provided as core subjects, not electives, in the DCP at this institution. There are six individual business courses in trimesters 7–10, consisting of Business and Practice Management, for a total of 195 hours. The program outline includes courses where students are taught the basics of 'running a practice'. Few participants were complimentary about the business courses provided in the program. There were some crucial gaps that participants felt needed to be covered in the business stream, such as:

Whenever we get out there it's how do you build a business? They teach us how to set up your practice, what type of practice you want, location wise. What's a good business model? But they do not teach you how to get the patients. That they just leave to you ... that's the biggest thing. (FG2P3(9))

Students felt well prepared and competent in their clinical skills. However, the same could not be said for their business competence:

I feel pretty comfortable being able to start, you know, day one after graduation and at least be able to, like, be on my own and be confident diagnosing and treating. The business aspect I really think is a little bit lacking. (FG1P2(8))

Those who had nearly completed their program were far more animated with their critiques on the quality of the business program: “I’m not sure that I would be able to say anything positive about the business program here at all, the business piece of my education” (FG5P2(10)).

Some even ascribed such adjectives as ‘horrible’ or ‘the worst’ when it came to the business stream. They found that the content was outdated, and any individual requests to update the content to make it more relevant were not met. Having poor knowledge and understanding of billing, coding and dealing with insurance companies were reasons for students not feeling prepared for business. Due to a lack of preparedness, they felt they would be learning mostly through ‘trial and error’. One participant recommended that nearby tertiary institutions may have better business course offerings to gain the required skills, as opposed to taking what is provided in their program.

Some participants took issue with the timing of the business courses: they were being delivered too late. The online mode of delivery was problematic and limited their sense of engagement, leaving them feeling removed from the course. One felt that:

It’s kind of forced down our throat [in the] 10th tri[mester] on a computer and its here’s how you do a business plan, make sure you market to your patients and be really nice. And it’s kind of the last five minutes before you graduate. (FG5P1(10))

However, the alternative of earlier delivery was not considered the best solution, as it may lack relevance. The majority of students provided examples and recommendations for

improvements to the business courses. These included more experiences in clinical settings and external practice settings to acquire the required skills. Such recommendations included observing practitioners in the field and engaging as an associate for the day in the hub and spoke clinics. Performing these more practical and hands-on tasks may allow students to learn firsthand about some of the logistics of running a practice. These included processing insurance and billing, running the reception area, scheduling and even managing the laundry.

One participant spoke of learning more in areas where they felt they were lacking by soliciting additional tutelage from their CE or managers:

I'm talking with the person here, usually, once a week, going over business aspects, going over your billings, going over how to talk to an insurance person or working on getting that set up so that next trimester we have a weekly meeting of just any questions that we have over business that's addressed. I'm like, 'Okay, well, why didn't they ever tell us this before'.

(FG2P1(9))

Building a business is difficult, and there were limited examples of how to build a chiropractic business through marketing, networking and referrals for the students to learn from in the teaching clinics. The clinics themselves seemed to retain long-standing patients with minimal initiative to build upon the practice base. Students were not learning practice building skills from their CE, and few examples of practice building were modelled in the clinical setting. There was no emphasis or initiative to build upon the clinical practices or patient population beyond the existing patient base. As a result, these clinical environments were not providing real-life experiences for students on how to recruit new patients. As the spoke clinics offer free or subsidised care, this provided the community with incentives to attend.

Understanding the principles of business is essential, as the majority of chiropractic graduates will move into the private sector for private practice, with few opportunities

available in hospitals and the community sector. A private practice setting can include several scenarios ranging in levels of independence. Some students will enter as an employee-associate practitioner or independent contractor in an already existing practice, generally under the guidance and mentoring of a more senior or seasoned practitioner. A more independent scenario includes developing a practice as a sole proprietor or purchasing an existing practice. Most participants felt poorly prepared for independent practice, but not because of their clinical skills:

But even the business program for the training behind opening up your own practice or going on to associate, its minimal. If you asked me if I knew how to go open up my own practice, my answer's no. I know how to treat, I know how to handle patients, do new patient exam, but opening up a new practice, absolutely not. (FG5P1(10))

Of all participants, only a minority of trimester 10 participants seemed quite confident to be immediately independent as a new graduate. Those who had prior business experience were far more confident in their abilities or aspirations as a new graduate: "I feel good that I had a practice before and, if I hadn't had a practice before, I'm not sure how I would feel about it. I would be careful." FG1P2(8th)

Participants acknowledged that the institution was aware of some of the critiques of the business program. Some welcomed the recent updates and modifications to the business program and new staff appointments for a professional development department. This initiative was to provide business support and resources to students and alumni.

As most participants will move into private practice, the importance of having an understanding of business cannot be underestimated. The participants did not feel equipped with the necessary theoretical and experiential learning to move into an independent private practice setting as a new graduate. Overall, there seemed a sense that students were provided with a quality clinical education in terms of their diagnostic and clinical competencies, but

were not comparably educated about business competencies. Clinical and business preparedness were not congruent.

5.9. Theme 4: Being Evidence-Based

The fourth and final major theme was ‘being evidence-based’. Being in an evidence-based program seemed essential to these participants. For some, it was the reason for their attending the institution.

Data revealed there was a strong evidence-based culture within the regular teaching faculty and curricula, as well as among the clinics and the clinic faculty. Journal clubs and grand rounds were a recent initiative added to the evidence-based culture and delivery:

But we do have journal club and even though I’m not a huge fan of it, like, it’s an effort towards getting us familiarised with researching and I think it’s really up to the individual student to research stuff on their own if they’re curious. (FG5P4(10))

Concerning patient care, some felt compelled to adopt the CE approach to being evidence-based as this was the only option: “Dr [spoke clinician] is all about evidence-based. You show up in his clinic and you work with him, both of them [CE], you better have evidence base or don’t bother to show up” (FG5P2(10)).

That said, there was some flexibility in the evidence-based approach in the clinics. For one participant, they felt they could engage in a more philosophically oriented approach towards patient care:

But I think as long as you’re able to back it up or have the same passion that ... they are very willing to allow you to practice the way you want to, but you have to be able to back it up and if you can do that then they’re willing to let you do that. (FG1P2(8))

There seemed to be a lack of consistency from clinic to clinic and from one CE to another. Some CE encouraged utilising the literature to support their patient management. A final trimester participant recalled:

I know a doctor [CE] at the VA's the same way [always practices evidence-based]. But I would say here at [hub clinic] that it's not really that way. Not that we don't do things that are evidence-based, but it doesn't have to be evidence-based for you because we don't know how everything works. Some things just work. (FG5P5(10))

Selected hub and spoke clinics had additional learning tasks and teaching to discuss and critically appraise the research. What did seem expected was that CE encouraged students to appraise the literature critically and justify their clinical decisions, hence focussing on the utilisation of research and literature, but not the other elements of EBP including patient preference and clinical expertise. Some participants found the expectation of EBP slightly restrictive, whereas others found it to be the strength of the program. The one element of EBP, utilisation of relevant research, seemed embedded across the entire program.

5.10. Summary

Chapter 5 has presented the thematic analysis from student focus groups conducted in 2013 and 2015. Four key themes and seven subthemes were raised by the 20 student participants.

Through this methodological approach, a detailed and rich description was provided by the student participant sample across several key themes relevant to the best practice of developing their clinical practice skills. While qualitative studies cannot provide generalisations, they can provide significant insight and exploration of key themes.

There were many key themes that were established as to what students valued the most, the least and evidence of best practices from their experiences in the clinical program. The first, second and fourth themes were mostly appraised as valuable aspects of the clinical program, with the third theme needing review and improvement. The first theme and subthemes emerging from the interviews were:

5.10.1. **Clinical preparation**

This was explored across the two stages of preclinical preparation: before entering the service-learning environments and upon completing the clinical program towards their transition to professional practice. Students viewed the way in which they were prepared across these two stages as a strength of the program. An existing purposeful scaffolding of the clinical program was important for their preparedness. A need for more experiential and situated learning during the preclinical phase and in the clinical phase would enhance their preparedness. Participants mostly felt they attained competence within the duration of the clinical program.

5.10.2. **Guided learning in clinic**

As the second major theme, this encompassed five subthemes that were each considered important aspects that contributed to students' learning and graduate preparedness. Some of these revealed strengths in the program, such as the subthemes 'clinical placements' and 'quality supervision and mentorship'. The remaining subthemes included areas in need of improvements such as 'encouraged to reflect', 'feedback' and 'IPE, IPL and IPP'.

A program that invited variation through clinical placements and resultant case mix, such as through the hub and spoke clinical model, facilitated the students' clinical development of skills, abilities and competence. The diversity of the clinical program—through the diversity and type of clinical placements, ranging from a low to a high level of complexity in the patient case mix at the hospital and VA placements—was integral and valued. Supervision and mentorship, from both faculty and peers, were fundamental elements in students' development and modelling of their clinical skills and professionalism through social learning theory and SLT. Feedback from clinical supervisors was valued and was not considered excessive or unwarranted. As the adopted model, the doctor-driven approach had

both merit and issues, with student autonomy being a concern with their clinical supervisor. Students were not proficient in reflecting on their clinical experiences and skills; this area was identified as needing further development. The essence of being a reflective practitioner, or engaging in reflective practice, was not perceived as an implemented or expected component in the clinical program; more could be done to encourage student reflection. IPE, IPL and IPP were provided as a low-level experience, mostly through exposure with minimal immersion and lack of mastery as far as experiences and engagement opportunities. More opportunities for interprofessional engagement were desired by participants, who saw both interprofessional engagement and patient-centred care as vital components for success in future practice. Despite their experiences, the majority of participants felt competent for future IPP.

In general, participants felt they were adequately provided for all of these subtheme domains, which they attributed as elements of best practice of their clinical program. The purposely designed and scaffolded program of the hub and spoke clinics, and the doctor-driven model contributed to all of the subthemes of ‘guided learning in clinic’.

5.10.3. Business preparation

The third major theme was an area was in most need of improvement, as it was considered integral to graduate preparedness. Business preparation was not ranked as important or even equally as important as clinical preparation. The majority felt they lacked competence in business preparation, in that they were not equipped for small business operation or being an entrepreneur. This perceived lack of skills will affect their professional prospects of obtaining a subordinate position under the guidance or mentorship of a practitioner. More is needed in the program as far as the business aspects of the program.

5.10.4. **Being evidence-based**

The objective of being evidence-based was obvious to participants as part of their expectations in the clinics, by their CE and as part of their student engagement. However, EBP expectations were not consistent across the clinical settings or among CE, even though it was the accepted standard and the strength of the program. The objectives and expectations of EBP were preparing students to meet industry expectations of referring to the literature in their approaches to patient care and diverse clinical environments.

Chapter 6 will present the thematic analysis of the new graduate participants and the key themes established through individual interviews and thematic analysis.

Chapter 6. Phase 4 Study Findings: New Graduate Perceptions and Experiences of the Chiropractic Clinical Program and How it Informed Current Practice

6.1. Introduction

Chapters 4 and 5 reported the findings of Phase 2 interviews with clinical faculty members and Phase 3 focus groups with students, respectively. Chapter 6 focuses on Phase 4, which examines the perceptions and experiences of new graduates of this chiropractic program and how it has informed their current professional practices.

The qualitative perspectives from three cohorts—faculty, students and new graduates—explored similar aspects from the perspectives of the different stakeholder groups. Data triangulation adds rigour to the study. New graduates formed the last cohort and the final phase of the study.

This chapter aims to explore the new graduates’ perceptions of and reflections on their experiences of the clinical program offered at the chosen North American chiropractic college that displays elements of best practice and has shaped their current practices. The aim of this phase was to capture the new graduates’ perceptions of the important aspects of the clinical program that developed clinical practice skills and elements of best practice from their clinical education.

The research questions addressed were:

- What aspects of the clinical education program developed new graduates’ clinical practice skills?
- What aspects of the clinical education program did new graduates value most and least?

- What do new graduates perceive to be best practice in their clinical education to develop their clinical practice skills to be practice-ready?

6.2. Characteristics of the New Graduate Participants

The new graduate participants were not from the same student cohorts, with some graduating three years prior and the majority being in their first year since graduating. Despite this, they all appeared to have experienced similarities in their clinical program as described in Chapter 3 and illustrated in Figure 3.2. New graduates, defined as no greater than three years since program completion, were invited to participate in the study. There were eight participants, with an unequal sex representation of two females and six males. To protect their identity, the exact ages of participants were not obtained but were estimated to be between 25 and 32 years of age. Grouped demographic data are presented in Table 6.1, including each participant’s current professional employment details. All participant details were de-identified in the analysis. Quotations from participants have been attributed using the new graduate participant number and the years since they graduated. For example, NG1(1) refers to new graduate participant number one who was in their first year since graduating.

Table 6.1

New Graduate Characteristics

Participant	Sex	Employment type	Type of professional setting
NG1(1)	Male	Contracted, postgraduate residency program	Interprofessional; Veterans Affairs
NG2(3)	Male	Independent contractor	Uniprofessional; multiple practitioners, private practice
NG3(1)	Male	Associate practitioner	Multiprofessional; private practice

NG4(1)	Male	Associate practitioner	Uniprofessional; multiple practitioners, private practice
NG5(1)	Male	Sole trader in own business	Multiprofessional; private practice
NG6(1)	Female	Associate practitioner	Interprofessional; private practice
NG7(3)	Male	Associate practitioner	Uniprofessional; multiple practitioners. Past employment was multiprofessional, private practice
NG8(1)	Female	Associate practitioner	Uniprofessional; multiple practitioners, private practice

Six of the eight participants were currently engaged in their transition year (one year since graduating) at the time of the interview. All eight participants were working as registered chiropractic practitioners, with some variation in the types of their employment arrangements. Four were engaged as associate practitioners working in a clinical facility under a principal chiropractic practitioner. Two participants were employed as an independent contractor arrangement in an established practice and one went into business on their own as a sole trader starting up a new practice. One graduate transitioned into a residency program at VA immediately following graduation. Seven of the eight participants were in the private practice setting. Five new graduates were in a uniprofessional clinic setting with other chiropractic health professionals. One was in a multiprofessional clinical arrangement and only two were currently in an interprofessional clinical setting. Of these two, one was in a residency program at VA. Three had moved interstate to practice, and the remaining five were practising in the same state as the chiropractic institution from which they graduated.

6.3. Interview Procedure

This study used individual interviews for the new graduate cohort due to this method's suitability to obtain an in-depth description of the phenomena. Individually scheduled interviews were more convenient than focus groups, due to the dispersion of new graduates in their respective employment arrangements, and provided an environment for more disclosure.

New graduates provided a rich description related to their current experiences in transitioning from student to novice practitioner, as well as retrospective reflections, perceptions and experiences of the clinical program. Both of these aspects were highly informative in contributing to the research questions and study aims.

During each interview, 30 open-ended interview questions were administered. The questions are provided in Appendix M. The intent and content of the interview questions are described in Table 6.2.

Table 6.2

Alignment Between Theory, Research Themes and New Graduate Interviews

Theory	Research themes	Interview Questions
ELT	The educational effect of clinical placements	What are your perceptions of the clinical education provided?
ALT, social learning theory	The perceived value of the current clinical program	How has the clinical program best/least prepared you for professional practice? At what stage in your education did you feel competent?

SLT	What constitutes best practice in clinical education to develop clinical practice skills to be practice-ready	Is there anything that may need to be added to the clinical program to assist future graduates?
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Note. ELT- experiential learning theory, ALT- adult learning theory, SLT- situated learning theory.

All participants engaged in individual audio-recorded interviews, which were recorded over the phone or by Skype. Interviews times ranged from 24 minutes to 65 minutes, with the average being 38 minutes. Following the final interview, no further data themes were emerging through participant’s interviews and data saturation was established.

6.4. Analysis

All interviews were individually recorded, professionally transcribed and checked for accuracy by the researcher. All interview data were placed into tables and manually analysed by the two researchers (NH and LJ). Preliminary themes and subthemes were generated. Some were collapsed and subcategorised into the predominant themes or subthemes and to reduce redundancies of similar categories.

From the individual interviews, four themes and five subthemes emerged and are presented in Table 6.3. As discussed in Chapters 4 and 5, several similar themes emerged between the students, faculty and new graduate cohorts, which are presented in Chapter 7 and in Figure 7.1. Verbatim quotations were included in the text to illustrate the participant’s perceptions and opinions.

Table 6.3*Themes and Subthemes Emerging from New Graduate Interviews*

Theme	Subtheme	Subcategory
Clinical preparation	Professional preparation— transition to practice	
Guided learning in clinic	Clinical placements	Hub clinics Spoke and remote internship clinics Hospital placement
	Clinical supervision and mentorship	
	Feedback	
	IPE, IPL and IPP	Post-licensure IPP
Business preparation		
Being evidence-based		

Note. IPE- Interprofessional Education, IPL- Interprofessional Learning, IPP- Interprofessional Practice.

The results, analysis and discussion of the eight new graduate participants are described according to the identified themes.

6.5. Theme 1: Clinical Preparation

As was found for clinical faculty and students, the first major theme from the new graduate data analysis was ‘clinical preparation’. This was further developed into the subtheme of ‘graduate preparedness—transition to practice’.

6.5.1. Subtheme 1: Professional Preparation—Transition to Practice

The objective of the clinical program was to scaffold students' learning and supervision through varied clinical experiences. This was achieved through commencing in the trimester 7 introductory clinic, with a highly supervised and mentored clinical learning experience, and transitioning into the hub and spoke clinics from trimester 8 onwards. Supervision tended to change to include more elements of adult learning principles as students progressed into the later trimesters and into the spoke placements, from 'hands-on' to 'hands-off' supervision (Iedema et al., 2010). The patients that are seen in these clinics also varied in their complexity, with students seeing more-complex patients as they progressed into the hub and spoke clinical settings.

Graduates remembered that the clinical experiences through these various clinical sites assisted them greatly in their clinical preparedness as transitioning graduates. One recalled: "because we had a wide range of different places for students to rotate to, so I think that they [students] may experience at least somewhat of what they will in private practice" (NG1(1)).

Confidence and surety were apparent in participants' preparation for the professional environment, in particular, in their ability to think independently: "figure it out on my own, so learning how to critically think was probably the best thing that anybody's ever taught me. I don't have to rely on anyone and I know where to look for the information" (NG1(1)).

The sense of knowing when and when not to consider chiropractic interventions as appropriate management for patients was an important outcome of their preparedness. This is an important principle: "and then basically telling them, "yes, I can help you with these problems, but I think you should see somebody else for some other issues you're having", and really helping to guide patients in the right direction" (NG5(1)).

New graduates felt well prepared in their ability to manage complex patients, which they attributed to their clinical experiences during the program. One graduate recounted:

I feel like I was well prepared for everything out there. Even some controversial patient cases that we were taught that ... in terms of referring patients out, I was really taught well enough. Whereas some of my [practice] colleagues in our team, they would want to wait it out and see and still treat the patients without having them refer outside. (NG7(3))

Competency is defined as the application and demonstration of appropriate knowledge, skills, behaviours and judgement in a clinical setting (Healthstream, 2011). Seven of the eight participants felt that they were sufficiently competent before completing their clinical requirements and prior to graduating. Several felt they were competent quite early on in the clinical program. For instance:

I would say, end of seventh trimester I felt like I was competent. You know, end of student clinic I felt like I had everything down pact. I knew what was going on. I knew how to treat a patient. (NG3(1))

This sense of attained competence may be attributed to receiving sound foundational knowledge in their preclinical preparation or from managing the less-complicated patients that were common in the introductory clinic. Others felt that competence came a little later in the clinical program: “probably before we started the last trimester of my clinical education, I felt most competent” (NG7(3)).

However, it is important to note that not all new graduates felt well prepared: “poor, I didn’t feel ready, I didn’t feel prepared” (NG2(3)). This participant reported that their sense of clinical competence came following two years of professional practice experience. What they experienced in the clinical program, did not translate well to the expectations and practice in the real world:

Examples of things that I was going to see and deal with day-to-day weren't really present for me through the clinic experience, it's hard; adjusting techniques, again, not really a lot of experience in clinics that transition well for the real world. Sure, we did things, but it was never really what it would be to be in a real-world practice situation. (NG2(3))

This graduate continued to identify deficiencies, which mostly related to patient care and planned management. There was a need for more clinical processes and algorithms in the clinic, as clearly illustrated in the following:

How do you evaluate them, how do you show improvement, how do document changes? All of these things that you look for now as a clinician there's no procedures from [named institution] and that's my biggest complaint about the whole clinic experience ... but there are absolutely no procedures and no flowcharts to follow and say, 'If this presents, what do you do next? If they're not responding, what do you next?' They never addressed that. (NG2(3))

For this participant, the VA placement also affected their sense of attaining competency and skills due to feeling as though they had limited autonomy in hands-on patient care. In a similar setting, another new graduate completed their long-term remote internship at a military hospital. This setting assisted in his acquisition of competence because of the number of complex patients they managed and “seeing real pathologies” (NG4(1)).

Aspects of the program that reportedly improved their preparedness were the opportunity to consult with diverse and complex patient populations:

Just because you start getting more hands-on and being not, not just treating your fellow students, your colleagues, but you're starting to treat actual, real patients and you're starting to manage those cases for prolonged periods of time. (NG8(1))

While some graduates reported that they did not feel entirely competent for all clinical situations, they knew their parameters and how to practice in a safe manner: “the fact that I knew how to not hurt someone. I might not be able to help them, but I knew, from what I had learned, how not to hurt them, and that’s what made me feel competent” (NG5(1)).

Only a minority expressed dissatisfaction with their clinical experience. For another participant, there was a difference in how they appraised the preclinical to early clinical phase and the later clinical phase: “okay, I actually learned a lot, up until seventh trimester; after seventh trimester it, you know, the education or maybe the clinical experience wasn’t as up to par as I was expecting it to be” (NG6(1)).

Most participants felt they were well prepared clinically, which is often referred to as the ‘hard skills’. Hard skills are the technical or clinical skills and knowledge, whereas soft skills are the professional traits of communication, time management, empathy, confidence and critical thinking (Balachandar et al., 2016). Some commented they did not feel as well prepared in their ‘soft skills’. For example, communication:

It was the only real issue with patients dealing with was explaining something that they could understand, ‘cause I was still using words that we were taught, kind of using the lingo to a more common language, where the patients would understand me. That was really the only difficulty. (NG7(3))

Despite feeling clinically prepared, new graduates found there were challenging situations. These included some discrepancies between the resources and information they were provided as a student and what they now experience in practice. For example, they encountered different case records systems: “and electronic health records is a little bit—quite different, well, from what our school does and what the VA did” (NG3(1)).

Record-keeping requirements in the teaching clinics were often reported to differ from industry standards. The hospitals and VA facilities often use a medical electronic health records system. These would not be typical of those used in chiropractic practice.

Participants felt less prepared to practise independently as a new graduate. For some, this affected their decision on where to work and in which type of employment arrangement. Graduates commented that they needed to further upskill to counter the deficits in what they had or had not been provided within the clinical program. They opted for further mentoring as a graduate: “chose to join a practice, because I thought my skills were so poor after graduation that, in order to be successful, I wanted to learn from somebody who had already been doing it” (NG2(3)).

Seeking a seasoned practitioner’s guidance and mentorship resulted in some graduates deciding to move into a multipractitioner employment arrangement. This arrangement would allow them to learn from others who they perceived had experience. However, for those who decided to start on their own, this proved to be more difficult: “but that was really more, I had to learn on my own” (NG7(3)).

Choosing to join an existing practice among other chiropractors seemed to be more common among these graduates. Only one of the eight graduates went into independent practice. All others engaged in associateships or independent contractor employment arrangements with other chiropractic practitioners. There may be other explanations for why these graduates sought these employment arrangements, such as financial reasons, but those issues were not explored. There was a trend to transition into a semidependent practice arrangement, which may be related to their sense of requiring further guidance and mentorship from the profession.

Only one participant moved into a residency program within VA directly after graduating. Their graduate experience varied from those of the other participants, as it seemed to provide fewer challenges:

My last year in clinic, I was in the VA in the last eight months and then, right after graduation, I had about three weeks off and then I kind of continued right into the VA again so the transition was a continual growth in just learning and to keep continued to learn stuff every day. (NG1(1))

Several participants had engaged in clinical placements in the VA facilities during either their spoke rotation or through the remote internship program. The clinical and professional experiences in VA settings were remembered as profound. The disadvantage of having such a profound student experience in the VA was that the professional experiences of private practice did not meet their expectations. For this reason, some considered pursuing the prospect of a postgraduate clinical residency at VA. However, this program did not seem to offer anything unique, from the student experience:

So, the residency, I can apply for, but I felt like I got the same experience from being a remote intern. I considered it, and I talked to my mentor and he basically told me, he said basically how they structured the residency, what I did at the externship, so he said, this is a repeat thing for you, maybe not the best for you. (NG3(1))

For some participants, one professional challenge was that it seemed they reached the pinnacle of clinical experiences as a student. While they would like to be engaged with VA as a practitioner, there were too few opportunities without acquiring additional credentials.

It is important for a new graduate to have sense of readiness when stepping from the educational to the professional platform. Whether this professional transition feels like a small step or a giant leap can be a testament to the institution. While the clinical program may not be identical to that of the professional setting because it is a teaching and learning

environment, it is still important to prepare the students for the expected climate they are to encounter. According to professional standards, the level of graduate preparedness is considered a significant benchmark as to the quality of a program. Overall, participants felt sufficiently competent before completing the program. The patients they encountered affected their competence, whether they were less complicated or more complex and diverse, as did having autonomous clinical experiences.

6.6. Theme 2: Guided Learning in Clinic

The second theme arising from the new graduate interviews is ‘guided learning in clinic’. New graduates reflected upon the various implementations and initiatives of the program that assisted them to learn the clinical and professional skills and attributes required of practitioners. This theme also explored aspects that were valued and not valued as both a student and practitioner. Four subthemes and subcategories were identified (see Table 6.4).

Table 6.4

Guided Learning in Clinic—Subthemes and Subcategories

Subtheme	Subcategory
Clinical placements	Hub clinics
	Spoke and remote internship clinics
	Hospital placements
Quality supervision and mentorship	
Feedback	
IPE, IPL and IPP	Post-licensure practice

Note. IPE- Interprofessional Education, IPL- Interprofessional Learning, IPP- Interprofessional Practice.

6.6.1. Subtheme 1: Clinical Placements

Generally, graduates considered the clinical placements to be a strength of the program, assisting greatly in their graduate preparedness. The diversity of experiences at a range of clinical placement settings was a positive aspect of the clinical program:

You get to see so many different facilities; the VA, the [named] community hospital, [named] university, [named] outreach centre, so I think you get to see so many different places ... the strength would be probably that the regular clinics [hubs] are set up more of like a private practice but the rotation sites [Spokes], they're kind of like little specialty places, and I think that the main strength would be just going and learning from all these different places.

(NG1(1))

The clinical placements include the introductory, hub and spoke clinics. The case mix seemed to vary among clinical facilities depending upon the clinical placement location and the community that they serve. Participants felt that having access to a varied case mix aided their graduate clinical preparation. Furthermore, it was a positive component of the clinical program.

6.6.1.1. Subcategory (a): Hub Clinics

The three outpatient hub clinics, located on campus and in nearby urban locations, serve fee-paying patients from the community. New graduates recollected that there tended to be a somewhat limited case mix in the on-campus clinics, such as the introductory and hub clinic: “for the most part, it was cut and dry” (NG4(1)). Another participant agreed: “so, while I was there [at hub clinic] minor aches and pains; I never really saw anything too complex while I was there working” (NG1(1)).

For some, experience at the hub clinic was not remembered as an engaging experience. This was usually due to the low number of patients to students and limited patient complexity. For this reason, they recalled their student experiences as often limited: “a lot of

people were struggling with getting numbers, getting good patients, seeing diverse populations or various cases” (NG3(1)).

With fewer patients in the hub clinics and limited patient interactions, there was a lot of downtime in some of these clinics:

I was sitting around some weeks with five patients in a week, and I had to be at the clinic for 30 scheduled hours. There was a lot of YouTube watching, and there was a lot of euchre being played. (NG5(1))

With too few patient interactions, efficiencies of practice were not required:

I would spend, you know, like an hour and a half with a patient because I knew I didn't have anyone else coming in after and no one needed the room ... I don't think that's going to work in real practice. (NG3(1))

A less than ideal experiential learning was reported, with too few patients available and the high contact hours required when placed in the hub clinics. As was found in the focus groups with students, new graduates reported issues with access to patients in the earlier stages of the program at these clinics. The trimester 8 students would be competing with trimester 10 students for patient encounters, with the more senior students given priority to complete their clinical requirements. This affected the quality of experience for the junior interns:

With the amount of students in the class before me there was not a whole bunch of opportunities in the first few weeks there, because a lot of them were trying to finish up their requirements. So there was a lot of sitting around, once they, the upper tris [trimesters] got their numbers and started to get rolling, it was a pretty good experience. (NG4(1))

6.6.1.2. Subcategory (b): Spoke and Remote Internship

Clinics

The spoke clinics, 13 in total, include clinical settings on college campuses, community, hospitals and VA facilities. These service-learning environments serve members of their respective communities either as a subsidised, low-fee or no-fee service. Conversely, the remote internship placement is external to the regular clinical program in specialty facilities. These placements are located at VA and DOD hospitals and clinical facilities and at an interprofessional pain management clinical facility. Few students are selected to complete their clinical internship in these competitive placements instead of in the regular clinical placements.

Graduates regarded their diverse and challenging experiences in the spoke and remote internship clinical settings as a strength of the program. This was particularly the case of the VA settings. Some of the reasons for this are:

I felt like I got a lot of good experiences, good cases that I may not even see in my whole career, as a chiropractor. The patients in the VA were harder to adjust, so that was great ... just, seeing patients constantly. I think I graduated with—I think the minimum is 250 adjustments. I believe I graduated with six hundred and something ... so it was a great experience. (NG3(1))

The higher patient volume and the challenging and fast-paced environment of the VA setting allowed for further skill refinement and learning about efficiency in patient care.

The spoke clinics tended to vary in patient populations and clinical presentations: “the youngest at paed’s was a baby of, I think, six months. And then the oldest, according to what they’d given us based off the paperwork, they claimed to be 95” (NG7(3)).

Students’ exposure to a variety of patient cases had many benefits for them in their professional practice experiences:

Not really afraid, compared to some of my other [professional] colleagues who were afraid to treat these patients, because I've already dealt with certain cases in a similar manner before that. Plus, the fact that the variety of our patient base helped me the most in clinical practice today. (NG7(3))

Because of their experiences in the spoke and remote internship settings, with a complex and varied patient case mix, they felt well prepared for the common presenting conditions seen by practitioners, such as: “very proficient in a lot of the common cases that chiropractors see, lower back pain, neck pains, stuff like that” (NG3(1)).

Across all the clinical settings, new graduates did not have many recollected experiences in seeing the younger, more specialty populations:
So that was probably the hardest transition I feel that's what they should figure a way where we can get some paediatric patients in there so graduates can have more hands-on to that, in case they want to do that. (NG7(3))

The paediatric population was the only patient type they felt less equipped to see as a graduate.

The new graduates' recollection of access to a varied case mix was mostly positive. They developed their initial clinical experiences and proficiencies with some less-complex patients, and saw more-complex and diverse patients as they moved through the various clinical sites. This allowed them to feel adequately prepared for the patient types and populations they now see as a practitioner. When they did encounter some of the more rare and complex patients and presentations as a new graduate practitioner, their sense of competence and proficiency came from having this exposure as a student. They felt more prepared than practitioners from other programs because of these student experiences. Overall, new graduates felt well prepared for the average patient they were likely to see as a

practitioner because of the many clinical placements offered through the introductory, hub and spoke clinical placements as well as the remote internship.

6.6.1.3. Subcategory (c): Hospital Placements

Students had access to hospital rotations through two means: as a spoke rotation and as part of the remote internship program. Participants found distinct differences in their clinical experience when placed in hospital settings compared to the spoke clinics. This was perceived as a strength and a positive clinical encounter for students because it was a far more intense environment, with patients waitlisted due to the demand for chiropractic care. There was consistent patient flow and a fast-paced environment. As a result, students were quickly meeting their prescribed clinical requirements: “so yeah, I kind of took a back seat but I still ended up with 600 at the end of the year, which is great” (NG3(1)), and from another student, “we were pretty much, we were booked every day. I don't know if I could put a number on it” (NG4(1))

With the high patient demand and volume, participants would lose track of their overall clinical requirements. This highlights the fact that instead of tracking their patient quotas, they could focus more on the quality of their learning and clinical experiences. Having sufficient patients available to students meant that the senior and junior students were not competing for access to patients. This seemed to encourage a collegial and mentoring environment, as illustrated here:

I tried to give the rotating interns a lot more patients, just because I knew that they were struggling with numbers way more than I was. So I, kind of, would see you know three a day, maybe two a day and, kind of, just monitor their notes and, kind of, help them, deal with patients and if patients were difficult. (NG3(1))

One of the other differences in the hospital setting was the type of patients that students would see. The patients were far more complex than what they had seen at other clinical placements:

Working with complex cases, patients who were bigger, or had symptoms that you know you can't really relate. I got really frustrated going into the VA clinic, for the first month because I was, like, nothing is a cookie cutter, nothing is like from the textbook and that's exactly what real life is like. (NG4(1))

Managing more-complex patients seemed to assist in their sense of confidence and clinical preparedness as a student and a graduate “because now if a complex patient walked in, like, I know I’m not going to get nervous. I know exactly what type of testing to do, how to evaluate the patient, if they were diagnosed with Parkinson’s earlier” (NG3(1)).

The types of patients consulted and care needed seemed to change the perception of their clinical abilities and contributions as a chiropractor. This was particularly the case when requiring a biopsychosocial approach to patient care:

I would just say dealing with a lot of the amputees, just having to change your adjusting style and stuff like that for those guys, and also dealing with a lot of people with traumatic brain injury and a lot of people came in very, hopped up off a lot of drug cocktails. So just being more than a chiropractor in that sense, it's sifting through that mental state and seeing what it is you can do for them. (NG4(1))

These settings also required a different level of professionalism:

Kind of just threw me into the situation where I was, like, I knew from the beginning that I can't act like a kid; I need to act like a grown-up, a professional, and that was probably one of the greatest strengths. (NG1(1))

From their experience within the hospital, participants developed a sense of the future purpose for chiropractic in these clinical settings. Another strength of these settings was that

the interprofessional opportunities were far more accessible: “I would have to say [named hospital] ... just hands-on and just the capability of co-mingling with other healthcare professions to see how they look at things, and what they would do for certain things” (NG4(1)).

While there were mostly positive reflections about the hospital placements, there were some significant differences that may be a weakness. One differentiation was that being in the hospital did not resemble private practice: “definitely wasn’t like real life because of the military system is so different than anything I’ve encountered so far [in private practice]” (NG4(1)).

This difference poses a problem when most chiropractors enter into private practice. This participant found that the hospital experience did not have many similarities to the requirements of private practice. This graduate referred to this as being ‘fairy-tale like’ in that the system allowed for almost optimal patient flow, patient retention and patient compliance with their care. This was not at all reflective of his current experiences in private practice. Another difference related to the administrative expectations and responsibilities needed in private practice, which were considerably different from the hospital experience. For instance:

I have no idea like how to create bills because we didn’t deal with that. We just pretty much, went in, picked up a patient, treated them and then had to let them go and then be able to deal with the scheduling at the front and then I’m not sure how the clinician got her money or how the clinic got money or even if they got compensated. I have no idea about that.

(NG3(1))

The business aspects of the hospital, compared to private practice, proved to be entirely dissimilar. With these procedures in place, patient compliance and retention were very different in comparison to a regular clinical setting. Overall, new graduates perceived

that while hospital placements provided valuable experiences, they did not necessarily resemble professional life for the average practitioner. When the business of the clinical setting does not reflect the professional setting, this requires the students to learn these skills as a graduate.

6.6.2. Subtheme 2: Clinical Supervision and Mentorship

The second subtheme of ‘guided learning in clinic’ relates to the social, experiential and situated learning aspect of the clinical program: ‘clinical supervision and mentorship’. By far, CE were perceived as a positive aspect of the clinical program and instrumental to the new graduates’ professional preparedness. Participants acknowledged the quality of the CE associated with the institution. They were reported as possessing a wealth of knowledge and expertise, and could contribute anecdotal experiences that assisted in their learning. In addition to CE quality, having diversity among CE was also valuable. Diversity was favoured over having only one educator’s perspective for the following reasons:

The vast knowledge and wide array of professors we had and their experience was varied, a great attribute. They brought all their experiences to us and really just didn’t leave a stone unturned for us. We were really prepared for a lot of situations. (NG4(1))

Even if we had the same patient, the case type, they still would treat it differently. Different aspects based on what they thought was more necessary ... I felt that gave me more rich diverse too in terms of how to practice in the real world ‘cause that’s what I see. (NG7(3))

However, some disadvantages came with the diversity of CE: “like, I know there has to be a standard across the board. One clinician could be amazing. The other one could not be as great” (NG3(1)).

Clinicians fostered student learning through the sharing of their clinical pearls and anecdotes. The graduates recalled that when they developed their skills and proficiencies, the CE adopted a more hands-off approach in their supervision by allowing students to have a

hands-on approach in patient care. New graduates appreciated those educators who showed trust and faith in their skillset. The effect that this has on the participant is clear from this quote:

Then, as you became a little bit more efficient and/or confident, you know, for some patients who were returning patients, the clinician might say, 'You know what, why don't you go in, and as long as the subjective information has either improved or remained, you know, essentially the same, I trust you to go and do your objective findings'. But I think that is a strength to give students that feeling of, I trust you and I commend your progress at the clinic. (NG5(1))

They did not feel as though they were unsupported; they were gently encouraged and guided through progressive autonomy. One new graduate remembered:

A lot of people don't realise, like, once you step into the room, their health is actually in your hands. And so it's a lot of responsibility and I think our school did a great job of helping me kind of de-stress from that responsibility ... you always have time to, kind of, discuss what's going on with the mentor. I think that's great. (NG3(1))

The personal attributes and quality of the CE were often mentioned as creating a positive learning experience. Their behaviours, enthusiasm and skills were important in allowing participants to observe, learn and model from their CE. For instance:

I got to absorb and you know, for the first two weeks you're literally just in the room listening to how Dr [name] was doing the whole patient education, how he treats his patients, how his, basically bedside manner. You know all the essentials and then you start to apply those things. It's almost like mirroring and following, you know you're only going to be as good or as powerful as a clinician as your experiences. So that really helped me mature into a professional and be able to communicate with different people. (NG6(1))

Learning through observation and modelling is essential, especially when there are exemplary practitioners for students to mimic and model. What also contributed to the development of clinical and critical-thinking skills was clinicians teaching through principles. The clinical supervision was not overly restrictive (e.g., through ‘lecturing’) or prescriptive under some of the CE. Their approach seemed to be teaching through guided questioning and encouraging the students to think. In other words:

Nobody ever says, like, pushing down their belief, their philosophy, they're not making for me to do things their way exactly, they're just, sort of, more like challenging me to figure out my own way and to critically think through it. (NG1(1))

Clinicians seemed to follow a model that would allow students to have academic and intellectual freedoms within the clinic, and not just duplicate their clinicians. As students, they felt that they were supported, provided with appropriate responsibility for patient care and encouraged to learn by enthusiastic CE. It was clear that their educators had a profound effect on influencing their preparedness to practice through multiple strategies. By providing clinical processes and procedures, this appeared to assist in developing their ability to clinically and critically think, analyse and appraise.

6.6.3. Subtheme 3: Feedback

The third subtheme to ‘guided learning in clinic’ is ‘feedback’. Further to the modelling and mentoring observed in CE was the importance of providing students with feedback. As graduates reflected, the feedback from their CE and mentors was significant and integral to their clinical development. All types of feedback were helpful and were welcomed by participants. The formal formative and qualitative assessments of patient encounters in the clinics were appreciated. Outside these formalised assessments, informal and ad hoc feedback that took place during their patient encounters was often valued more: “yes. I’d say the ad hoc [feedback] was more important than the scheduled [feedback] actually” (NG5(1)).

I felt like Doctor [name] did a good job. She was constantly critiquing me. She would kind of critique you while you're adjusting, regardless of whether it was graded or not graded. She was like, 'Hey try this; you need to go deeper'. So, she would, kind of, critique me that way, but it wasn't—I wouldn't say it's very standardised. It's very, like, in the moment, I would say. (NG3(1))

Receiving any form of feedback was helpful to improve students' clinical decision-making processes, as were the purposely directed questions related to their specific patient interactions. As one participant recalled:

I mean we've come out of a new patient exam and I'd get bombarded with questions, like, well, what about this. So just that thought process and growing and that thought process as a clinician is definitely crucial, it's hard to grow I think ... if you don't have that feedback. (NG6(1))

For some, there was a desire for more feedback. The students received feedback that was sometimes not necessarily constructive and could even have been viewed negatively. While feedback was occasionally harsh, it was regarded as being essential to their development as competent practitioners:

I've been yelled at multiple times. It's very, like, constructive feedback I got from them, but you know, like, missing out on little things here and there were, you know, not taking a history quickly. I understand it, because they were just trying to make be better and because they're great at what they do, and there's a reason why they're mentors. So I don't take it to heart, I love criticism. (NG3(1))

While it sometimes seemed challenging to receive constructive feedback, participants identified that there was always a learning opportunity from this, especially when it related to patient safety:

There was those experiences that make you better, you know that now I'm never going to not put a tuning fork to a rib because you know, the patient thinks that a rib is out it might be fractured ... there's always something you could do better and just getting that feedback helps me so much in being better and being more helpful towards the patient. (NG6(1))

From the new graduates' perspective, they felt they were receiving quality, genuine, mostly sufficient, timely, specific and constructive feedback from their CE. Feedback was highly influential in the development of their clinical skills and was valued at all times. Whether feedback was positive or negative, there was a learning experience for themselves, and it was crucial for the safety of patients.

6.6.4. Subtheme 4: Interprofessional Education, Interprofessional Learning and Interprofessional Practice

The fourth and final subtheme of 'guided learning in clinic' is IPE, IPL and IPP. Retrospectively as students, these participants rotated through hub and spoke clinics, or elected for remote internship placement. These ranged from being uniprofessional to being multiprofessional or interprofessional. Several of these clinics have students and supervising practitioners from other health disciplines.

Because of the diversity of the clinical placements offered in the hubs, spokes and the remote internships, the recollected interprofessional experiences were varied. All participants had their own unique and individualised student interprofessional experience. Three participants engaged in interprofessional settings of the remote internship clinical placements, such as the VA clinical facility and a chronic pain clinic. Of all the clinical placement facilities, the VA clinics seemed to provide more of an interprofessional experience. Such experiences were had "yes, daily ... so physiatry, physical therapy, the orthotist, orthopaedic surgeons, neurologist, rheumatologist, radiologist, a lot of people you intertwine with and work with" (NG4(1)). Another participant reported similar experiences: "it was a lot of

collaboration with different, types of providers, different disciplines. We would talk to the radiologists, we would talk to neurologists, the primary carers” (NG3(1)).

While there may have been the presence of members of other health professions at specific clinics, there was not always formalised interprofessional engagement about clinical cases. Instead, participants tended to engage in an informal and ad hoc manner at the hub clinics:

Yeah, there was nutrition, yeah, there's acupuncture, but there's very little crossover ... if you're friends with somebody in a program, you might be able to, but you know standing in a room with a more senior doc and saying nothing. (NG2(3))

Sometimes, having proximity to other disciplines and professions in the same facility allowed for an organic engagement, where no formal arrangements between professions were necessary. Therefore, some participants felt they had authentic experiences with an interprofessional culture.

Of particular interest was one graduate's perception that the educational institution was not supportive of interprofessional engagements in their clinics: “I think the school actually shunned upon a little bit, and I think that's a disappointment” (NG2(3)).

The spoke community and hospital-based clinics had more interprofessional opportunities because other medical, allied health and complementary professions were co-located:

The rotations were a great resource for that. [Spoke community clinic] was multidisciplinary; there were a lot of, yeah, a lot of different ones that we saw, you know, and the acupuncturists, massage therapists, herbalists, dentists, all across the board, for sure. (NG5(1))

For the most part, the interprofessional culture appeared to be various professions co-located within a facility. For some, this went a little further, with informal interprofessional

encounters: “I guess it was more hallway discussions, you know; I wasn’t involved in the other practitioners’ treatments, really. Just communicating with them and shooting the breeze, you know” (NG5(1)).

Yet even these informal interprofessional encounters could lead to further conversations about health practice in general or about specific cases for consulting, such as: *Other disciplines always had their doors open to us, so if we had a patient that was, like, a really complicated patient came in and we had, like, all the neurologist notes we could always, like, go and they’re all just across the road and be, like, ‘hey what do you think of this MRI, what do you think is going on, these are the patient symptoms’. Or if you’re just, kind of, getting his opinion on a case.* (NG3(1))

These examples mostly occurred in the VA and hospital placements. Other interprofessional engagements were through having access to and sharing patient clinical records: “when I was visiting at the VA and you’re able to see every medical provider’s notes and every social worker and everyone and VA communicates your notes and consults that way” (NG1(1)).

Having access to other practitioner records was perceived as being of great benefit. This was because it provided a complete patient clinical profile to assist in patient care: *And so for new patients, we could look up you know PSA levels. We were able to look up all old X-rays, if they had them. So it, kind of, gave it, like, good background information, before we dropped into a patient.* (NG3(1))

This access to other practitioner records also allowed them to access patient information that they may not have otherwise had. In the VA and spoke community settings, the interprofessional culture seemed to be a referral-type approach among the various health professions:

During that clinic, we had the medical clinic above us and we were in the basement. And so they would be referring patients back and forth to us. And some of the patients we would send them back up there if we felt that we couldn't really treat them or there was an issue that we really couldn't treat them chiropractically. (NG7(3))

There was an acknowledgment that there was a lack of coordinated interprofessional engagements. While the interprofessional culture aimed for a patient-centred care approach, there was not a collaborative arrangement between the various professionals: “but it wasn't like a patient showed up and then all of us would, kind of like, evaluate it all and then collaborate. It wasn't like that” (NG3(1)).

Despite there being some limitations of the interprofessional engagements, participants saw strengths from having these experiences. For instance, it helped to facilitate IPL between the various professions and reduce some professional barriers and misconceptions:

Our mentors, they did a great job in terms of, you know, trying to break down these primary carers who are really against chiropractic and, and they did it with, you know, like, these amazing narratives that they would send out to the primary carers ... kind of showing expertise in what we do. (NG3(1))

It was clear from the data that from being within an interprofessional environment, graduates came to understand how different health professions can all contribute to patient care. Consequently, this minimised a profession-centric approach to patient care that could otherwise occur. In other words:

Realising that your individual patients respond differently to different things. There is no best treatment, I don't think. There are shades of grey of course, but I don't think there's a best treatment for ... so, in summary, I realise that interdisciplinary approach is great because people respond to different measures. (NG5(1))

Another benefit of being placed among the other health disciplines was the professional legitimacy it provided:

That has a big impact on our profession in the future [when members of the other professions], realising how much we as chiropractors know and can contribute and just understanding how to interact with other providers and making them realise that we're not, that we actually do know what we're talking about. I think that was definitely the strength.

(NG1(1))

Furthermore, having these interprofessional exposures enabled them to learn how to communicate with other health professions appropriately, in particular, not using professional jargon:

It helped me in terms of wording, what is a referral ... knowing what—for example, like you shouldn't be saying subluxation. That, is a big no-no because, like, the way that the medical world looks at a subluxation versus the chiropractic world is totally different. You know so, saying things like that will change the way that medical professionals perceive you. (NG3(1))

It was difficult to arouse any recall of perceived weaknesses from their interprofessional experience. It was clear that the interprofessional experiences were appreciated and were a highlight of the clinical experience.

6.6.4.1. Subcategory (a): Post-Licensure

Interprofessional Practice

One objective of providing IPL and IPP within the students' clinical program is to encourage post-licensure IPP. From the interviews with new graduates, it was clear that their student experiences influenced their graduate IPP:

It changed my mindset going forward. Coming into school I wanted to have my own practice, you know, want to work by myself, but doing the VA, I was like, this information is so valuable, it's way better to collaborate with other healthcare professionals in order to help a

patient. My experience, part of the VA part of the exchange, kind of, changed my outlook on my career and I think it's highlighted how we can collaborate with other disciplines.

(NG3(1))

The demographics of new graduates (see Table 6.1) showed that only two participants consider themselves to be practising in an interprofessional clinical practice setting and two are practising in a multiprofessional practice setting. The remaining new graduates are in a uniprofessional setting with multiple practitioners of the same profession. The reason why one participant perceived their workplace as a multiprofessional rather than an interprofessional setting related to the practice arrangements—multiple health practitioners leased consulting rooms in a professional suite. With this co-location, referrals were sent to other health professionals within their facility, but this was driven by the patient:

I refer to the people under my roof, but I kind of leave it up to my patients to figure it out ... where I will refer patients to massage therapy or acupuncture, and vice versa. I have not really collaborated on a care plan, you know, we're both kind of creating a care plan together. (NG5(1))

Only one participant reported being in collaborative IPP with an acupuncturist and massage therapist.

It was obvious graduates had a clear preference towards an IPP setting because of their student experience. Half of the participants reported currently working in or were engaged in uniprofessional practices, despite the fact they had interprofessional experiences in the VA facilities and hospitals. The reason for this was mostly because of opportunity, or lack thereof, as one reported:

I wanted, actually, an associateship that kind of mirrored my [student] clinical experience but I wasn't getting any opportunities in those types of clinics just yet ... no, I'm just in a chiropractic practice right now. It's myself and two other [chiropractic] doctors. (NG6(1))

Being in a uniprofessional clinical setting does not preclude IPP. Those situated in uniprofessional practice settings engaged with other health professionals through non-solicited written communications as a professional courtesy: “after we consult with a patient, we’ll send a letter to the medical doctor, their primary carer or whoever referred them to us. I wouldn’t say we’re directly speaking with them” (NG3(1ST)).

Written correspondence regarding the care provided was a professional courtesy to other practitioners. Another key reason for writing a letter to the practitioner was to inform them about chiropractic. In other words:

It’s almost like a marketing tool, I would say. It’s like, ‘Hey I know what I’m talking about, this is my expertise and this is how we’re going to treat them. This is how long we’re going to treat them’. So, it’s kind of like keeping them updated as to what’s going on. (NG3(1))

Generally, hospital and VA placements provided more IPE, IPL and IPP experiences than the other clinical settings, and this encouraged IPP in graduate clinics to ensure patient-centred care. The interprofessional experiences were a strength of the program and were valued by participants. Participants reported varying levels of IPP as a graduate. Their only criticism as a professional mostly related to a lack of professional opportunities and engagements, despite what they may have experienced in their clinical program.

6.7. Theme 3: Business Preparation

The third theme that developed from the interviews with new graduates was business preparation. As was seen in discussions with the clinical faculty members and student participants, no specific questions were asked during the interviews regarding business courses or business preparation, but this topic emerged as a theme.

Having a strong sense of business acumen was perceived as being just as important as having the clinical acumen. However, similar to the students’ views described in Chapter 5, these graduates stated business preparedness was not at the forefront of the program: “yeah,

it's not really prepared us for business. And that's something that I know we were told when we were in the program that that's the biggest complaint and I agree with that" (NG7(3)).

Another recalled that the business stream provided was insufficient and not at an acceptable standard: "so for me, I thought the business aspect of the college was probably the worst part" (NG2(3)). Only one participant felt that the business curriculum met their requirements and expectations. Citing the same reasons as the students, the graduates thought the mode of course delivery seemed to be one problem. Distance delivery and learning influenced their engagement and retention, as clarified by this participant:

We're taught that through an online class and it would have been best if the person should be in front of me teaching me this, instead of me sitting there for about two, three hours whenever I have free time to read something. Which probably may or may not really not stick with me. (NG7(3))

Not all students could learn through online courses; some preferred the more traditional didactic teaching methods. There was also concern with the relevance of the content taught on business and that there were other important aspects that were missing, specifically: "we're really not taught on structure on how to set up our own just to begin with" (NG7(3)). From another participant:

But I wasn't sure, when I first started my business, exactly how to file my taxes properly for a business. Little things like that about actually running a small business were things I had to learn on the way. (NG5(1))

Areas of deficit included some of the more essential business concepts, such as how to run a practice. Some struggled with knowing the expected industry standards in practice, such as how to appropriately bill and code for insurance companies: "cases like compensation and how to deal with auto injuries, and that was really more the difficulty" (NG7(3)).

Knowing their way around industry expectations, such as the individual insurance company requirements, was a particular area where new graduates felt challenged: “after you graduate, it’s always going to be like that first year of learning. And that was my objective, like, that’s one of my goals to you know master billing and documentation by the end of this year” (NG3(1)).

They often had to learn this after they graduated through self-directed learning and trial by error. While there was a sense of not feeling prepared for the billing and documentation requirements, there was an acknowledgment that there was variability in the field. Several factors, such as individual insurance company requirements and state law legislation, made it challenging to encompass all in the program.

This sense of feeling underprepared for business affected some of the new graduates’ decisions about whether they would start on their own in practice. One participant said this was because: “I didn’t feel comfortable going out, working on my own, starting my own practice from scratch in the beginning ... it didn’t. I had to join another practice ... to learn what I needed to be successful” (NG2(3)).

Among the eight participants, only one engaged in an independent business arrangement, starting a practice on their own. The remaining seven participants engaged in employee-type arrangements with other chiropractic practitioners, such as in a residency program or as an associate or independent contractor in an already established business. Initial independence in practice was a rarity among participants. Their responses mostly revealed that this was primarily due to insecurity and lack of confidence in business aspects of practice management despite having confidence in their clinical skills.

The majority of participants reported that they were gaining further knowledge and experience from established practitioners in the field. In summary, few felt the theoretical or clinical program provided an opportunity to develop the relevant business skills and abilities.

They felt unprepared for the daily administrative requirements of practice and the work necessary to build a business.

6.8. Theme 4: Being Evidence-Based

The final major theme from the new graduate participants was ‘being evidence-based’. A common perception among participants was that this institution provided a ‘science-based’, or ‘evidence-based’ program. The evidence-based perspective, or the element of referring to the research, was embedded throughout the program. This seemed like a part of the overall culture and expectations:

I mean, any class that we had, there was always articles, research articles, even if there weren't you had to basically do your homework or ... if there was a paper, you always needed, you always needed about three or four references from a peer-review article or research. (NG6(1))

This same participant reported:

Just that scientific background, [named institution] does a great job of laying down the foundation for you to practice and for you to be that scientifically evidenced-based. However, you need to build on those skills because there's more out there to learn. (NG6(1))

Most new graduates were aware of the need to keep up to date and the importance of lifelong learning. At specific spoke clinical sites, such as the VA facilities and hospitals, there was a different and higher expectation to be evidence-based: “it was a little bit different at the VA because everything was evidence-based ... yeah, the evidence-based is definitely very critical” (NG3(1)).

Not all participants felt that strong evidence-based approaches were necessarily an advantage. This was because sometimes, the evidence-based approach was considered too restrictive to allow for flexibility in patient management and patient preferences. One participant commented:

I mean, for example, the [named] VA does not use hot packs on the patients, because of the lack of evidence for that ... I'd put money on the table, a lot of money on the table, to say you will never convince ninety per cent of my patients to stop using heat or taking a hot soak when their muscles hurt. (NG5(1))

It was clear that graduates thought the EBE at this institution appeared to be stronger than in other chiropractic programs. One participant made a comparison to practitioners of other chiropractic programs:

Yes, we pressured very much to an evidence-based approach to treatment ... because from what I gather from some of the other clinicians that I collaborate with is not everything they were taught was evidence-based. Some of it was purely anecdotal, but where they were taught being labelled evidence-base ... and, unfortunately, you can't really tell your employer who has more experience than you, who graduated from the other schools, that, oh, this is not really evidence-based. (NG7(3))

In summary, the evidence-based aspect of the program was a component that participants were particularly proud of, and what they felt was a strength of the culture and practice of their graduates. However, when they referred to evidence-based, this emphasised the utilisation of the research and not equal appreciation and utilisation of clinical expertise and patient preference. The EBP delivery and expectations carried from the classroom to the teaching clinics influenced their professional practice. The issues with this culture mostly related to when the EBP approach became overly prescriptive or too restrictive when focussing on the relevance to research literature in patient care, or when fellow professional colleagues were not following a similar ethos, which may have resulted in conflicting opinions and practices within their own practice or profession.

6.9. Summary

This chapter has presented the four key themes and five subthemes raised during interviews with new graduates in 2013 and 2015. These categories have been summarised in Table 6.3 and have been discussed in detail.

As was found in focus groups with students, the first theme and subtheme that emerged from the interviews were:

6.9.1. Clinical preparation

Clinical preparation was a major and important theme of best practice of the clinical program. The purposive scaffolding of the clinical program was important in their preparedness. Most participants felt that the regular clinical program and remote internship placements prepared them well. They felt they attained sufficiency of clinical competence within the clinical program's duration, with the exception of one participant.

6.9.2. Guided learning in clinic

The second theme included four subthemes, all contributing to the quality of their clinical learning. The variation in clinical placements and the resultant case mix—through the hub, spoke and remote internships—enabled students to develop their clinical skills, capabilities, proficiencies and competencies throughout the program. The diversity and type of clinical placements, with increasing patient complexity in the later trimesters, provided invaluable experiences that shaped how well students could adapt to the professional setting.

The CE were a highly valued aspect of the program. Their exemplary skills and knowledge of clinical and professional practices provided an ideal for participants to model under the experiential, situated and social learning frameworks. New graduates felt they were provided sufficient feedback as a student, both positive and negative, and would always welcome more. This was an essential element of their clinical learning. Participants felt their

CE provided timely, sensitive and constructive feedback that they valued when mostly in the patient encounters.

Experiences with IPE, IPL and IPP were variable among the participants due to the diversity in placements. Some graduates had very profound interprofessional experiences in the hospitals and VA settings that were hard to replicate in their current professional context. Most interprofessional experiences were within the remote internship settings. Across all of the placements, there was a lack of formalised interprofessional experiences; exposure to interprofessionalism depended on the setting having an established culture for its implementation. However, new graduates were actively engaged in or were seeking interprofessional engagements in either the clinical care and practice settings.

6.9.3. Business preparation

The new graduates had the same views as the student cohort in relation to business preparation. They perceived they were ill-prepared for business—their business preparation was not comparable to their clinical preparation—and lacked engagement with the business courses delivered in the later trimesters. Their professional arrangements translated into joining other established practices and practitioners to learn more about the craft of running a business. Initial independence as a graduate was rare among these participants, as they felt poorly prepared for the entrepreneurial skills they needed for independent practice. There is a need for more business education in the program to equal the graduate's clinical acumen. Business preparation was a weakness of the program and one aspect of the curriculum in most need of review and reform.

6.9.4. Being evidence-based

The final theme, EBP in the curricula and clinical setting, was a perceived strength of the program. Participants considered this a distinguishing feature of their program compared to other chiropractic programs, which showed in their professional practice skills. Evidence-

based culture and expectations of referring to research literature and application in clinical decision making were integrated throughout the curricula and present in the clinics. Some settings, such as the hospitals and VA, had a stronger and higher expectation about EBP. This evidence-based ethos made them proud and unique compared with graduates of other programs. Similar to the CE and student cohorts, what seemed to be missing from the EBP equation were patient preferences and practitioner experience.

From the qualitative design, a detailed and rich description was provided by new graduates across several key themes that contribute to best practices in clinical education. The new graduates provided significant insight across a range of topics from their experiences in the clinical program. They also considered how these experiences translated into the professional context, including how the program prepared them as a professional and when they felt competent, the strengths and weaknesses, and how things could be improved in the clinical program. The interviews explored their current challenges as new graduates and how the quality of the program could be developed that would improve their transition into practice. A positive outcome was that all participants had successfully transitioned into professional practice as registered and employed chiropractors.

Chapter 7 discusses the analysis of the three data collections.

Chapter 7. Discussion: Elements of Best Practice in Chiropractic Clinical Education

7.1. Introduction

This study aimed to capture the perceived critical aspects and elements of the clinical program's best practice that develop a students' clinical practice skills and prepare them to transition to practice. The aims were addressed through a EDQ design across three phases of data collection with different study stakeholder populations. The previous three chapters presented the stakeholder findings from the perspectives of clinical faculty members (Chapter 4), students (Chapter 5) and new graduates (Chapter 6) of the chosen American chiropractic institution. There were common perceptions and themes established through individual interviews with clinical faculty members and recent graduates and focus group sessions with students. This chapter collates, interprets and discusses the study findings compared with the current literature, where available, and the pertinent theories underpinning clinical education. The research questions were:

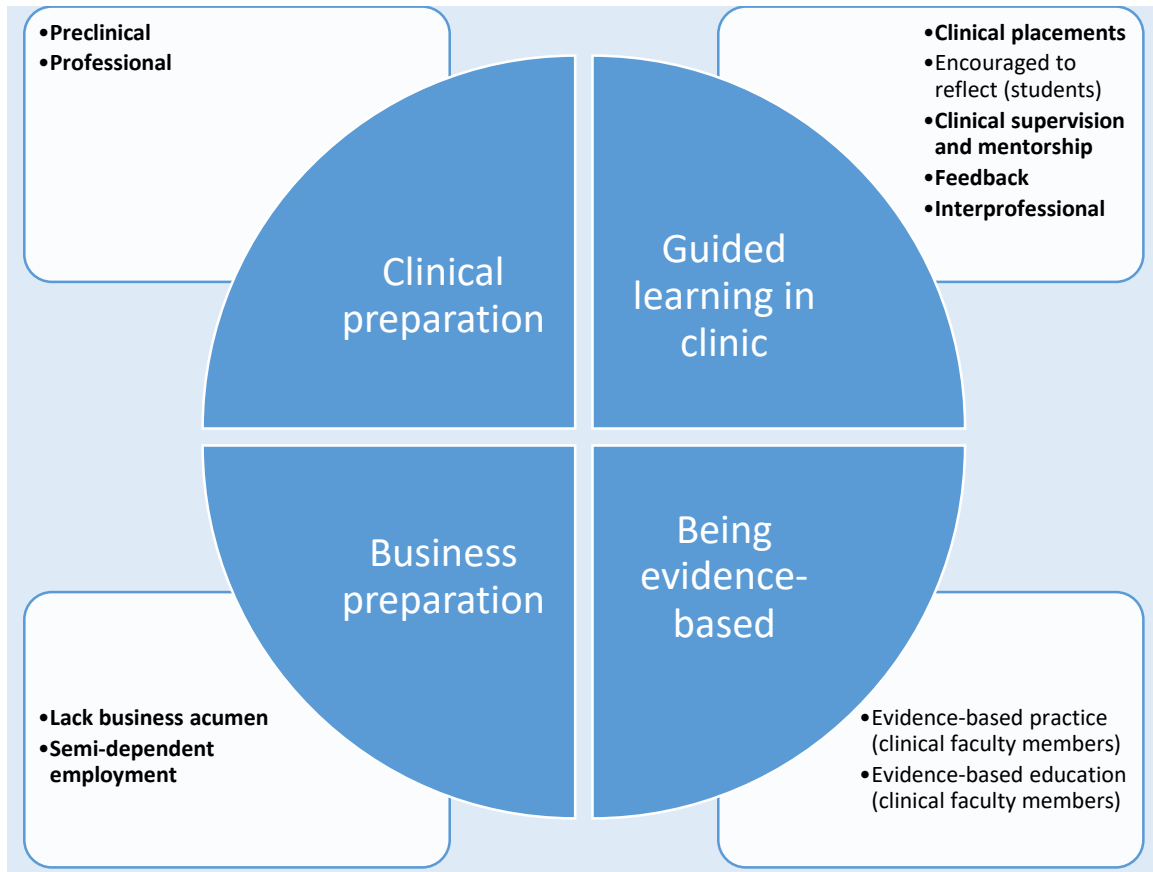
- What aspects of the clinical education program develop students' clinical practice skills?
- What aspects of the clinical education program do stakeholders value most and least?
- What do stakeholders perceive to be best practice in clinical education to develop students' clinical skills so they are practice-ready?

All these elements were explored from three participant populations' perspective using an inductive thematic process. Preliminary themes, subthemes and categories were compared to determine convergence and divergence across the major themes. It should be

noted that there was consistency in the themes and subthemes across the faculty, students and new graduate cohorts. This created a more unified representation, presented in Figure 7.1.

Figure 7.1

Themes and Subthemes from Three Stakeholder Populations Exploring Best Practice



Note. Items in bold represent the subthemes that were common to all three stakeholder groups.

7.2. Clinical Preparation

7.2.1. Preclinical Preparation

The thesis findings suggest that the preclinical program offered during trimesters 1–6 appeared to provide quality curricula in the foundation studies and clinical sciences. The experiential learning activities provided within the classroom and laboratory seemed to prepare students reasonably well in their transition to the trimester 7 introductory clinic.

7.2.1.1. Experiential Learning

Previous studies have highlighted that using an experiential-learning approach, problem-based learning (PBL), during the preclinical period positively affected students' performance in the American-based standardised chiropractic assessments (the National Board Examinations) (Shenouda et al., 2003). Students who had PBL within their curricula had a statistically significantly higher performance in their basic science disciplines and in their overall assessments for their National Board of Chiropractic Examiners examinations when compared to traditional, lecture-based chiropractic delivery (Shenouda et al., 2003). The main objective for implementing PBL was to increase self-directed learning so that during the clinical practice curricula, students learned the skills to be lifelong, evidence-based, chiropractic physicians (Shenouda et al., 2003).

At the exemplar institution selected for the current study, the scaffolded learning leading up to the formal clinical program was provided through students' experiential, social and situated learning among their peers and faculty tutors in simulated patient encounters. This reportedly assisted in students' performance as well as the development of their clinical skills and their critical and clinical thinking and reasoning skills in a structured setting.

7.2.1.2. Simulated Learning Environments

Osteopaths found that this type of simulation 'affords trainees to safely practice clinical skills, procedures or routines in a SLE before actual patient exposure and may offer a strategy to bridge the gap between the classroom and clinical education' (Fitzgerald et al., 2019, p. 1). Another benefit of simulated learning is that it provides the ability to develop complex patient scenarios that align with learning needs (Fitzgerald et al., 2019), which, in this study, likely contributed to students' preclinical and clinical preparedness. It has also been reported in nursing that clinical simulation allows the instructor to see a learner perform within a controlled environment that permits immediate debriefing and action, with the

opportunity for repetition (Jeffries, 2012). A recent study of 42 students found that physical assessment, teaching and critical-thinking activities occurred more frequently in simulation. Students performed a greater percentage of activities in higher levels of Miller's pyramid (Sullivan et al., 2019). Thus, simulation affects efficiencies, whereby more clinical reasoning and activities can be accomplished (Sullivan et al., 2019).

Despite being well prepared for the formal clinical program, some clinical faculty members noted deficiencies in students' retention of core knowledge for future needs. A perceived disconnect between the curricula delivered and what is perceived as necessary for future clinical practice. Whether this was due to delivery mode, assessment type or a need for more simulated learning and PBL was not established. However, it has been found that the method of assessment is an important factor to chiropractic students' learning, as this drives student learning, shapes the curriculum and prepares students for their transition from the classroom to patient care (Mrozek et al., 2006).

The faculty sentiments in this study align with a previous chiropractic scholar's commentary that lecture-based teaching and learning promotes superficial learning and assessments that reward the students' reproduction of facts, resulting in students memorising to pass an objective examination (Shreeve, 2008). Shreeve suggests that "lecture-based instruction appears to be limited in developing retention of learned concepts and, more importantly, application of the knowledge in a clinical setting that requires critical thinking" (Shreeve, 2008, p. 24). Such sentiments resonate with the findings from this study as to the type of teaching and learning and students' retention of knowledge, where more interactive and integrated student learning and assessment during the foundational content may assist students in making linkages for future clinical purposes.

7.2.1.3. Integrated Curricula and Learning

From this thesis, CE found students were challenged in their abilities to integrate this theoretical knowledge in the clinical context, in the form of a meaningful patient consultation and management plan. One factor that can result in students' poor understanding of subject matter, critical thinking and problem-solving is when the curricula are packed, which results in educators telling students what they must know and commit those facts to memory (Lujan & DiCarlo, 2006). From studies in medical education, curriculum integration from the basic sciences and clinical concepts helps students develop clinical-reasoning skills (Venkatesh et al., 2020). Adopting blended learning and learner-centred and adult learner principles and models into the preclinical undergraduate medical education enhances a shift towards competency-based education and lifelong learning for students of medicine. Thus, educators become facilitators of learning and not simply distributors of content (Venkatesh et al., 2020). Venkatesh and colleagues (2020) utilised blended learning as an effective teaching and learning strategy to foster integration, application and relevance of basic sciences to clinical contexts (Venkatesh et al., 2020). Integrated learning with early clinical exposure has been stated to improve motivation, help put knowledge in context and reinforce medical students' learning (Bowness & Gibbs, 2007). Furthermore, it offers longer periods of professional socialisation to students that assist in their preclinical to clinical transition (Bowness & Gibbs, 2007).

Some extreme perceptions of chiropractic students are that they tend to be 'fact spewing robots' due to the heavily weighted didactic delivery compared to experiential learning, which is a common critique of chiropractic programs (Morgan & Morgan, 2006). To overcome this, there must be (a) a reduction in factual information required, (b) a reduction in the use of the passive lecture format and (c) efforts to assist students in becoming active, independent learners and problem solvers (Lujan & DiCarlo, 2006).

Similarly, the following has been noted previously about chiropractic students:

The transition period from basic science studies to full-time clinical studies, including the internship or preceptorship, is often a difficult time for students because of the differences and complexities between basic science knowledge and clinical circumstances. This is commonly seen with many students in a variety of health care programs, including chiropractic. (Beck et al., 2009, p. 20)

Comparable findings have been found with medical students, where they do not feel sufficiently prepared for their transition from the preclinical to the clinical phase of undergraduate training (Prince et al., 2005). Perceived deficiencies included applying theoretical knowledge in clinical practice, knowledge in basic science, knowledge organisation and professional socialisation (Prince et al., 2005). A different type of knowledge was required from what students acquired in their preclinical training, acknowledging they studied for recognition rather than understanding (Prince et al., 2005). To improve, students suggested a more gradual transition, an extensive introduction into the clerkships and a closer integration of preclinical and clinical education.

7.2.1.4. Earlier Experiential Learning

In this study, students expressed a need for earlier and broader experiential learning opportunities; neither practicals and simulations with peers nor observing chiropractic practitioners in the field to orient to clinical settings and expectations was sufficient. Such sentiments support what has been previously noted from chiropractic educators, that chiropractic students will gain far more from experiential learning than rote learning (Morgan & Morgan, 2006). Wiles (2020) recommends that chiropractic education include early and sustained clinical exposure in the curriculum as early as their second week of chiropractic school, through weekly observations, selected tasks and purposeful reflection on experiences with private practitioners. In this study, field practitioner observations, or 'shadowing', was

part of these students' curricula and was reported as one of the most valuable experiences for experiential, social and situated learning. These findings are congruent with another study, where students wanted to assume their chiropractic identity early by getting to know their profession through early professional integration and becoming part of a community; thus, they have an opportunity to grasp the 'tricks of the trade' (Palmgren & Laksov, 2015). Similarly, medicine has found many benefits that emphasise the students' social nature of learning and identity formation through CoP whereby they transition from legitimate peripheral to full participation (Cruess et al., 2018; Lave & Wagner, 1991). Through this, they acquire the identity of community members and accept the community's norms (Cruess et al., 2018).

Other chiropractic studies have identified the significance of early experiential learning. For example, CMCC emphasises the importance of early clinical experiences, such as observership for role modelling and student mentoring in the early phases (Wangler & Wiles, 2011). Some European programs introduce students to clinical early via hospital clerkships (Humphreys & Peterson, 2016; Myburgh & Mouton, 2008) and student observations in the outpatient teaching clinic in the first year of their program (Humphreys & Peterson, 2016). Perceived benefits include students' engagement in deeper learning by seeing real patient pathologies alongside the periods of heavy, theoretical content delivery and integrating their theory into practice (Humphreys & Peterson, 2016).

In the United Kingdom, early experiential learning has become part of undergraduate curricula, driven by adult learning trends. This has included short and repeated transitions into and out of varied workplaces from the start of medical studies and before clerkships (Yardley et al., 2012). In the USA, physiotherapy programs provide experiential learning through professional practice experiences, but researchers acknowledge that this may be integrated throughout the curriculum, particularly during the didactic period, to enhance

student engagement, knowledge application and retention and their confidence in interpersonal skills (Smith & Crocker, 2017). The Stanford Healthcare Innovations and Experiential Learning Directive (SHIELD), at Stanford University in the USA, was developed in response to increasing student demand for early, authentic, longitudinal and meaningful clinical experiences. This value-added medical education program embeds the early student into real healthcare teams with targeted patient care responsibilities, such as health coaching, home visits, postoperative follow up in different healthcare delivery settings (Lin et al., 2017). Similar to the findings of this study, medical and allied health disciplines share the view that authentic early experiential learning is needed to make medical education more effective and engaging (Yardley et al., 2012; Smith & Crocker, 2017; Lin et al., 2017).

7.2.2. Professional Preparation

There was broad agreement that the purposely scaffolded and longitudinal clinical program examined in this study resulted in students' attainment of the required chiropractic skills and competencies. There were disparities in when students' skills and competencies were attained, commonly perceived to be within trimester 8 or 9. However, a minority perceived this occurred either earlier in the clinical program or after transitioning into the profession.

Several objectives of chiropractic education include cultivating clinical confidence in novice practitioners (Boysen et al., 2016) and fostering students' professional confidence and competence in patient communication and clinical skills (Hecimovich & Volet, 2009). Yet, there has been little published on how chiropractic students gain confidence in their overall clinical skills (Boysen et al., 2016). Hecimovich and Volet (2009) proclaim that understanding the relationship between confidence and chiropractic students' clinical learning environments is important as the "student may possess a high level of perceived

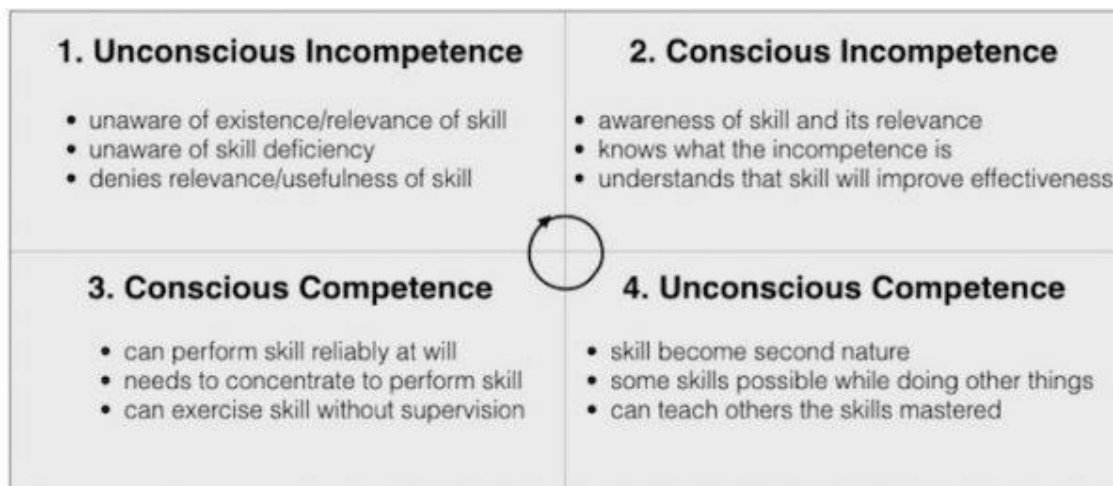
confidence prior to commencement of their clinical rotation, only to be hit with a dose of reality” (p. 154), which may adversely affect their confidence. Students will have fluctuating levels of confidence based on clinical challenges and results. Of more significant concern is the student who feels confident despite their lack of clinical experience (Hecimovich & Volet, 2009).

Previous research has shown a disconnect between self-assessed confidence and objectively measured competence (Wayne et al., 2006). ‘Competent’ represented what individuals knew about their ability and was based on the individual’s previous experience of the task, whereas ‘confident’ described a judgement that influenced whether an individual was willing or not to undertake an activity (Stewart et al., 2008, p. 903).

According to Adams (n.d.), levels of competence show four phases from unconscious incompetence through to unconscious competence (see Figure 7.2.)

Figure 7.2

Phases of Competence



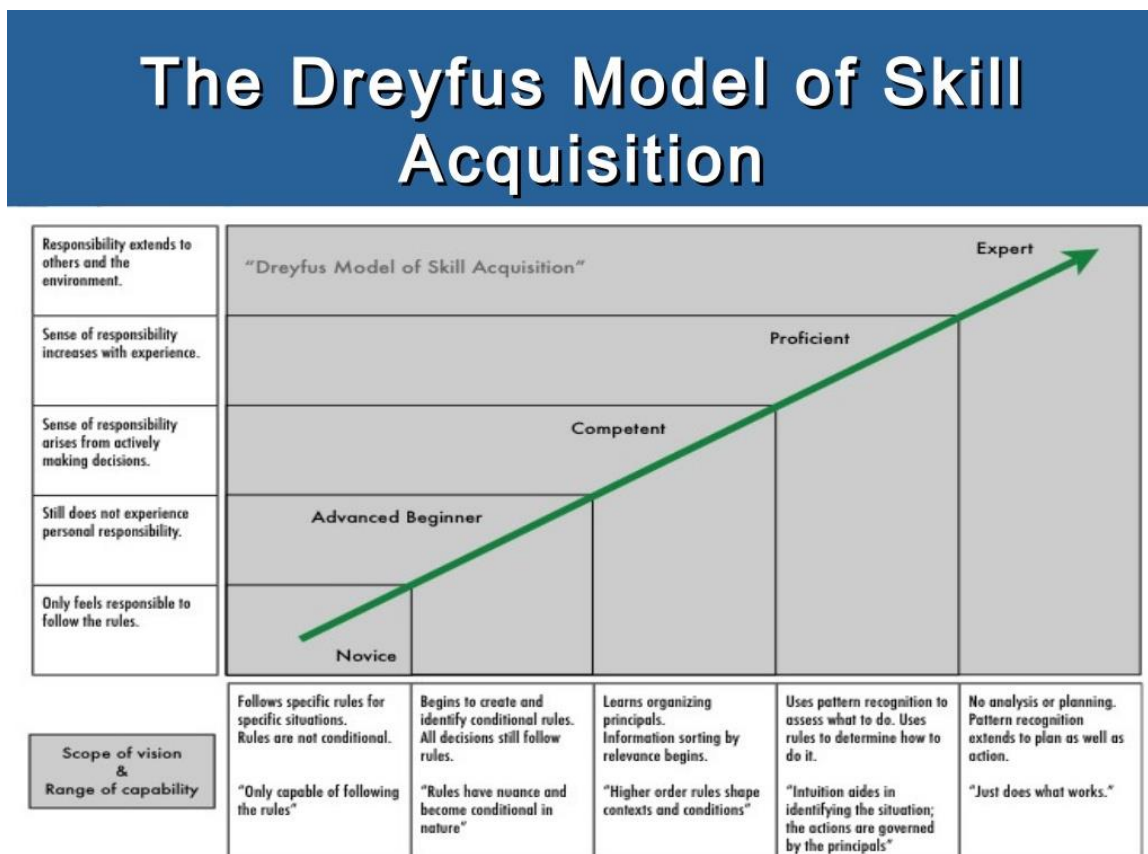
Note. Adapted from ‘Conscious Competence Matrix: The Process of Learning a New Skill or Behavior’, by W. Keyser, 2018 (<https://venturefounders.com/conscious-competence-matrix/>).

In the public domain.

Later, Benner (1984) and then Dreyfus (2004) explored the ‘five-stage model of adult skill acquisition’, which is represented in Figure 7.3. When these models are applied to the stakeholders finding from this study, students would mostly transition from novice through to advanced beginner and competent by the time they enter the profession.

Figure 7.3

Dreyfus Model of Skill Acquisition



Note. Adapted from ‘Patricia Benner: Novice-Expert Theory’, by M. A. Adiong, 2014 (https://www.slideshare.net/xenna_85/patricia-benner-38508791). In the public domain.

Research has shown that guided practice into the profession develops chiropractic students’ professional confidence (Hecimovich & Volet, 2011). The internship is more significant in building a students’ confidence than any other learning opportunity, as confidence increases with experience through clinical exposure (Hecimovich & Volet, 2012). In a nursing study that used qualitative analysis, Tabari and colleagues (2006) found that six

categories influence competence development: experiences, opportunities, environment, personal characteristics, motivation and theoretical knowledge.

New graduates in this study felt competent and well prepared in their clinical skills and knowledge of chiropractic principles for the private practice setting. They also understood their practice scope once in the professional environment. They did not feel equally competent in their business skills and knowledge when commencing in private practice, which is discussed further in section 7.5. Some felt that competence is not achieved within the duration of the program; rather, competence is tested and achieved as a graduate in the professional setting. The importance and need for development of competence are also described in the nursing literature, whereby competence is on a continuum that may increase or decrease over time in pre-registration and post-registration nursing experiences (Tabari et al., 2006). The acquisition of competence is a process, not an endpoint (Backhaus et al., 2015).

From the chiropractic perspective, a recent pilot study explored European chiropractic graduates' perceived preparedness for practice against the seven key competencies of the Canadian Medical Education Directives for Specialists (Pulkinnen & de la Ossa, 2019). This revealed a gap between graduates' skills and practice. Graduates scored lowest in their perceived preparedness in several competencies: collaborator, scholar and manager. The highest scores were related to professional and chiropractic expert competencies: 'practicing consistently with the ethical standards of the profession' and 'being conscious of the limits of my personal knowledge and acting within these limits' (Pulkinnen & de la Ossa, 2019).

The type of clinical placement was critical to students' readiness for transition to practice, as other chiropractic studies have reported. The influence of clinical placements on chiropractic students' perceptions of preparedness for practice has been explored by Todd and colleagues (2017). They found that students' perceptions improved following intensive

clinical rural outreach, due to the higher volume of patient encounters and variable case mix (Todd et al., 2017). Similarly, American students found their perceptions of clinical confidence improved from an intensive placement that allowed them to deliver chiropractic treatment in an authentic setting with frequent repetitions of technical, clinical and professional skills for future practice (Boysen et al., 2016).

Amorin-Woods and colleagues (2019) found that an intensive, remote, CIPs improved students' professional attributes as well as their diagnostic and therapeutic skills, especially when compared to the clinic experiences at their institution. A more recent qualitative longitudinal study of chiropractic and osteopathic students found perceptions of readiness to transition to practice was influenced by the type of and variation in clinical placements; community and private practice settings prepared them significantly better than their institutional clinic (Haworth et al., 2020). This was also related to patient volume, students' access to patients and efficiencies of care. Limiting students' experience to one clinical placement may not provide adequate preparation for practice (Haworth et al., 2020).

7.2.2.1. Best Practice

In this study, a common theme along all the stakeholder groups was that there were three key elements of the scaffolded and longitudinal clinical program that contributed to clinical and professional preparedness. These were:

1. The type of clinical placement: the spoke settings were the most influential because of the higher expectations for students' professionalism, efficiencies and EBP approach to patient care. This was likely due to the patient populations and the immersion with other health professions. The VA and hospital placements were perceived as the ideal teaching and learning environment to develop the

clinical and professional skills for graduate preparedness. This is discussed further under the subtheme ‘clinical placements’ in section 7.3.1.

2. The diversity and complexity of the patient: patient complexity and diversity were also influential to the students’ clinical and professional preparedness.

Experiences with more complex patients required integrating clinical knowledge and an integrated approach to the patient’s care. Again, the spoke clinics tended to have a more diverse and complex patient case mix, although this was not formally assessed within this study.

A North American chiropractic program found that the students’ experience with patient case mix in their community setting provided appropriate learning opportunities to achieve the competencies necessary for practice (Lishchyna & Mior, 2012). Humphreys and Peterson (2016) contend that the Swiss chiropractic programs, where student placements are within the hospital, provide them with access to complex patients; this results in students who are well placed to manage patients as a graduate (Humphreys & Peterson, 2016). Seeing a diverse and complex patient case mix has a positive influence on chiropractic and osteopathic students’ experience, skills development, sense of professional identity, attributes and readiness to transition to practice (Haworth et al., 2020).

3. The clinical supervision and mentoring: receiving supervision and mentoring from their CE and peers—through situated, experiential and social learning opportunities—and student autonomy positively affected their development of clinical competence and professional preparedness. Hecimovich and Volet (2012) also found that chiropractic students’ encounters with clinicians and clinicians’ feedback were key factors in their clinical and professional confidence.

7.2.2.2. Areas for Improvement

Findings from stakeholders revealed there were four elements of the program that could be improved to enhance professional preparedness:

1. *Application of education theory*: the key benefit of SLT is that students learn when they engage in communities of practice through legitimate peripheral participation (Lave & Wenger, 1991). Such activities encourage the formation of professional identity. This study's findings indicate that the social and situational learning experiences between peers, CE and members of the profession were valuable in providing a strong professional identity. Further individualised mentoring and engagement with field practitioners across the program was desired for clinical, professional and business development skills. The need for students of chiropractic to be involved in and belong to their community through situated learning has been identified as paramount to a sound educational environment (Palmgren & Laksov, 2015). That study reported that by doing so, students were provided with professional identity and professional prosperity. To grow professionally, they approached the chiropractic community with a desire to grasp 'the tricks of the trade' and an urgency to establish an apprenticeship model. Palmgren and Laksov (2015) argue that establishing pertinent environments that take communal belongingness into consideration is essential for chiropractic education.
2. *Interprofessional clinical practice*: students who engage with, identify and model mostly from those of their own discipline or profession can have worse educational outcomes (Pecukonis et al., 2008). Pecukonis, Doylea and Bliss (2008) recognise that medicine and nursing have identified difficulties in reconciling various professional cultures. In the current study, situated and social

learning helped students and new graduates feel competent for IPP engagement. While stakeholders felt satisfied with IPE, there is a need to continue these learning and practice engagements so that students do not become too 'chirocentric' in their clinical practice and professional skills as a practitioner. There is a need for interprofessional cultural competence during their training to avoid students developing profession-centrism (Pecukonis et al., 2008).

3. *Hospital and VA clinical placements:* even though, in general, all stakeholders identified that their preclinical and clinical experiences prepared students and new graduates to operate in hospital and VA facilities, there were limited professional opportunities in these facilities beyond the student clinical placement. Places in postgraduate residency programs and employment opportunities in these settings are competitive, and it is necessary to have further postgraduate qualifications. This was an unfortunate outcome for those who completed their remote internships in these settings, with no easy pathway as a professional. Similar to the findings of this study, Dunn (2006) found that chiropractic students who completed their clinical internship at a VA facility did not obtain employment in hospitals or similar specialty settings. Compared to non-participants, there were no differences in career, professional activities, income, career satisfaction or multiprofessional clinical setting as a professional (Dunn, 2006). From the Australian context, academics from Murdoch University explored whether a non-metropolitan, CIP for chiropractic students led to graduate employment in a similar setting. Despite a positive attitude towards practising in this setting, this was not reflected in their employment profile (Amorin-Woods et al., 2019).

Due to the unlikelihood of the average graduate attaining professional employment in these settings, some CE felt these were unnecessary clinical placements. A future broader study across chiropractic programs, similar to those conducted by Dunn (2006) and Amorin-Wood et al. (2019), could explore the internship placements profiles, compare them to the professional profile and make recommendations for future clinical program placements.

4. *Additional areas of chiropractic competence:* business knowledge, chiropractic techniques and specialty populations were areas that the stakeholder groups felt were not mastered adequately within the program. Further clinical and professional knowledge and skills in these areas were needed. This point was raised about chiropractic education by Pulkinnen and de la Ossa (2019). They suggested there might be a gap between education and professional practice in perceived preparedness, such that graduates perceived themselves to be unprepared in some professional competencies (Pulkinnen & de la Ossa, 2019). Students in this study suggested the need to supplement the curricula with additional learning activities and certifications external to the institution, gaining further qualifications and skills in chiropractic techniques, specialty populations and business knowledge. The discipline of physiotherapy has developed residency and fellowship programs to meet the need for advanced knowledge and skills in a specialised area of training and practice to meet patient needs (Furze et al., 2016). Yet, this is not the professional entry requirement within medicine, established in the early 1900s (Furze et al., 2016), where residency serves to allow a novice clinician to improve knowledge and skills under a more experienced clinical expert (Furze et al., 2016; Barr & Tichenor, 2013). Other chiropractic academics have expressed a need to increase the length and breadth of chiropractic

internships (Murphy et al., 2008; Murphy et al., 2016; Wangler & Wiles, 2011; Wyatt et al., 2005); one additional year of training, such as a mandatory residency or postgraduate internships, is needed to improve the graduate profile (Murphy et al., 2008; Murphy et al., 2016; Wyatt et al., 2005). It is possible that further development of these competencies and internship specialties within the curricula would make the graduates from this institution more employable and appreciated by the profession and industry.

While previous chiropractic studies support the findings of this study, future research that specifically explores the effects of the above-mentioned elements will assist in developing a chiropractic clinical model that better prepares graduates. Such research may include a more specific exploration of the effects of clinical placements and experiences with diverse and complex patients on students' attainment of clinical competence and confidence.

7.3. Guided Learning in Clinic

7.3.1. Clinical Placements

In this study, the variety of clinical placements was a core element of the clinical program. The diversity of the clinical placements offered was a frequently mentioned strength and a valued aspect of the clinical program. Each student had an opportunity to experience chiropractic healthcare delivery across a diversity of clinical settings. Each of the clinical settings was unique regarding student activities, the model of supervision, the patient population, clinical governance and other teaching and learning activities provided.

In HPE, it is acknowledged that clinical placements are important because they provide mechanisms for clinical skills training, professional socialisation and integrated learning (Darcy Associates, 2010). From their study of best practice in CLEs, Darcy Associates (2010) found that to be effective, the environment must provide learners with

challenging learning opportunities and have authentic professional practice experiences in a safe and supportive setting to become practice-ready. Learners are given access to patients and clinical staff; context for the learner to critically evaluate and reflect on their practice; and opportunities to take responsibility, work independently (under supervision) and receive feedback (Darcy Associates, 2010).

The quality of the clinical placements provided in chiropractic education has historically been a concern for chiropractic academics (Kaser et al., 2014; Morchhauser et al., 2003; Nyiendo & Haldeman, 1986; Puhl et al., 2017, Wiles, 2020; Wyatt et al., 2005). Many have been promoting the need for diverse clinical settings and different patient populations to best prepare students for professional practice (Haworth et al., 2019; Morchhauser et al., 2003; Nyiendo & Haldeman, 1986; Puhl et al., 2017; Wyatt et al., 2005).

From this study, the diversity of clinical placements settings contrast the criticism often directed at chiropractic clinical education for its lack of breadth and depth, mostly due to chiropractic students seeing patients in a college-based teaching clinic (Wiles, 2020). Concerns raised by CE surrounding the lack of quality and quantity of experiences for chiropractic students, compared to medicine and other health disciplines in the hospital and varied ambulatory settings (Wiles, 2020), seem to have been addressed with the hub-and-spoke model offered at this institution.

7.3.1.1. Introductory Clinic

This first level of scaffolded learning in the longitudinal program within the on-campus introductory clinic was an appropriate platform for students to develop their clinical and professional skills. This setting was perceived as both a less challenging and less threatening environment, attributed to the low-complexity and more-familiar patient case mix seen within a highly supervised environment. However, it could be argued that because of

students' familiarity with the patient base, this clinical environment was much more representative of a simulated rather than authentic clinical experience. Yet there is merit in allowing students to develop their clinical skills consulting with the uncomplicated patient, such as the 'walking well' or 'worried well' (Haworth et al., 2019) in the earlier stages of their clinical program, as long as this is not all they see in the final stage of their learning. With mostly student peers as patients, the additional benefit of the introductory clinic is that it provides experiential, social and situated learning, and many 'teachable moments' from which both the student intern and the student patient can learn.

Several chiropractic authors have critiqued these types of clinical placements of traditional, institution-based teaching clinics (Humphreys & Peterson, 2016; Murphy et al., 2008; Wiles, 2020; Wyatt et al., 2005), as they are perceived as not providing a clinical-learning experience reflective of the professional context (Wyatt et al., 2005). The patients who attend chiropractic student teaching clinics are commonly friends and family members of the student attending as a favour, potentially receiving unnecessary interventions and treatment (Wyatt et al., 2005). A recent study of chiropractic and osteopathic students' clinical-learning experiences similarly found that the patients in the institution-based clinics were typically younger, with milder presenting complaints, and were not representative of those seen by practitioners. Students had a clear preference for seeing patient they were less familiar with, where they were unhappy about the dominance of encounters with students as patients (Haworth et al., 2019). This may be the case in the introductory clinic; however, this only one of many clinical placements provided to students at this institution. A discussion of the hub clinics is presented below.

7.3.1.2. Hub Clinics

The second level of scaffolding learning in the longitudinal clinical programs occurs when students transition into one of the three hub clinical settings. In these clinics, students

and CE consult with members of the general public, where the educator uses a doctor-driven model of patient care and supervision. This clinical setting most resembled private practice in the type of patients that attend and case mix that was reasonably varied and complex. However, the learning element that was least valued in this setting was the limited patient flow, which created competition among students.

Stakeholders perceived that this clinical placement seemed to prepare students with the clinical skills needed for graduate preparedness. They were perceived as a more authentic clinical experience that resembled real-life practice, and were a setting that provided learning opportunities that significantly helped them develop the desired competencies. Students observe patient consultations led by their CE/chiropractic doctors and see firsthand the expected industry standards. Students and new graduates preferred to encounter patients who had real health concerns, which confirms a recent study that also identified a clear preference for chiropractic students seeing patients they were less familiar with (Haworth et al., 2019). Furthermore, this aligns with Darcy Associates' (2016) report that from the explored best practices in CLEs for medicine and allied health, learners should engage in authentic professional practice experiences with access to patients and clinical staff in a safe and supportive setting towards practice-readiness. In this study, this seemed represented in the hub clinical setting. The spoke clinics are discussed below.

7.3.1.3. Spoke Clinics

The final phase of scaffolding in the longitudinal clinical program consists of students rotating into the spoke clinics that are placed in the community, on campus, in hospitals and in VA settings. Reportedly, these placements provided a more varied and complex patient case mix that often required a biopsychosocial approach to care. Unlike the introductory and hub clinics, the spoke clinics provided students with access to more patient encounters; thus, increased patient demand and volume meant they could get more 'real', hands-on, practical

clinical experience. This necessitated students developing effective time management, efficiency of practice, higher professional and clinical skills. Thus, the spoke settings are perceived to be the most authentic clinical experience of the program. They were appraised as the most valued clinical placements for an optimal experiential, social and situated learning experience for students, with genuine patients and skilled CE preparing students well for their transition to practice. These elements improved the student's skills and confidence to the point where they felt they could handle almost any clinical situation or complex presentation that may present to them. No other data is available with which to compare these findings.

Of all the spoke settings, the VA and hospital placements were perceived as a significant strength of the clinical placements and clinical program. These settings were far more intense, with higher patient demand and flow, and patient complexities that challenged their clinical knowledge, skills and application. These were considered the ideal teaching and learning environment to develop the students clinical, professional and interprofessional skills for graduate preparedness.

Similarly, other authors have emphasised the importance of chiropractic students' clinical training in hospital settings, as students experience patients with complex physical and psychological comorbidities (Wangler & Wiles, 2011). The hospital setting is an ideal teaching venue for undergraduate and postgraduate chiropractic students (Walker, 1998), as it affords students with greater access to patients (Till & Till, 2000; Walker, 1998) and interprofessional engagements (Walker, 1998), which were confirmed in this study.

Chiropractic experts from the accrediting bodies of the councils on chiropractic education also believe that the student clinical experience within the hospital setting is beneficial in enhancing the students' training in their diagnostic skills in addition to improving communication between mainstream health disciplines and chiropractic (Innes et

al., 2019). Others recommend that chiropractic education evolves to include these hospital settings and complex patient base in clinical programs (Wangler & Wiles, 2011).

7.3.1.4. Patient Case Mix

It is essential that students have real and genuine patient experiences with patient cases similar to those expected in the professional context; this will allow them to develop their skillset and, particularly, have experiences with complex patients under guided supervision in clinical settings (Puhl et al., 2017). The academic leads of any DCP have a responsibility to ensure their students will graduate with core knowledge and skillset sufficient for the professional obligations of a primary contact healthcare professional (Puhl et al., 2017).

The patient demographic data and case mix were not collected or compared for this study; nevertheless, solicited questions about case mix generally revealed that the patient case mix was diverse and a highly valued aspect of the clinical program. Even though the introductory clinic had a limited patient demographic and were mostly low-complexity patients, the outpatient hub and spoke sites provided students with a varied and complex patient case mix. There were a few exceptions where students had experience with special populations, such as pregnant patients and paediatrics. That said, understandably, certain patient populations would be inherent to the clinical placement site: the VA facilities only see veterans and college campus health centres only see college students.

Overall, stakeholders in this study concur that the students' experience with case mix was perceived as well rounded and reflective of professional profiles. This finding supports earlier studies that identified that some chiropractic clinical programs have a diversity of patients that reflect that of the professional chiropractic practice (Puhl et al., 2017).

An analysis of the patient case mix of Murdoch University's chiropractic teaching clinic revealed students are experiencing straightforward, uncomplicated cases, which allows

them to develop their skills and competencies in a low-risk environment. Yet, they could not determine whether graduates were adequately prepared for specialty populations, acute presentations or patients with a disability; proposed hospital or external placements may address this limitation (Ricci et al., 2019).

In this study, it was reported the students were offered few opportunities to consult with paediatric cases. Having little experience with paediatric patients is not unique to this chiropractic program, as other North American chiropractic programs have also found limited student clinical experiences with paediatric patients (Kaeser et al., 2014; Morchhauser et al., 2003; Puhl et al., 2017). At the institution in this study, additional provisions were made by having electives and on-campus clubs to give students experiences with paediatric cases. Yet having limited access to specific patient populations seemed to affect student and new graduate participants' confidence in managing these patient groups as a practitioner.

A previous study detailed findings from four American chiropractic colleges who had collected patient demographics and presenting complaints from the on-campus, off-campus and outreach teaching clinics of their respective colleges (Morchhauser et al., 2003). They concluded that different types of teaching clinics facilitate greater diversity in the patient population, which broadens the clinical training for chiropractic students (Morchhauser et al., 2003). More recently, Logan University conducted a study exploring patient case mix through patients' demographics, chief complaints and comorbidities at their four fee-for-service chiropractic teaching clinics, and compared this to the patient population of practising chiropractors in the USA (Kaeser et al., 2014). Kaeser and colleagues (2014) concluded that the cases that students consulted appeared dissimilar in many respects to those seen in chiropractic practices throughout the USA. They identified a lower prevalence of certain comorbidities (obesity and hypertension) presenting to their teaching clinic. They recommended using patient simulations to bridge the gap between the teaching clinic

opportunities and what field practitioners are managing in private practice (Kaser et al., 2014).

More recently, researchers at CMCC conducted a study to compare the case mix experienced by chiropractic students during their clinical internship against published data for practising chiropractors (Puhl et al., 2017). Their data was inclusive of a college campus clinic and five community-based clinics, of which two were hospital settings. The data showed that student participants encountered multiple complex clinical cases, yet few had experience with paediatric populations. They concluded that patients presenting to the diverse CMCC teaching clinics were similar to those attending private chiropractic clinics (Puhl et al., 2017). As CMCC provides similar clinical placement settings to this North American study, comparisons may be made of whether patient profiles and case mix from the hub and spoke clinics provide a diverse patient base reflective of professional practice and sufficient for the obligations of a chiropractic graduate.

In summary, the clinical placement model seems to be an exemplary model for the intention of scaffolded, student-centred clinical learning. Across the four trimesters of clinical placements, patient complexity increased, as did the students' clinical and professional expectations. While it is not proven, the findings of this study infer the criticisms of earlier authors (Haworth et al., 2019; Morchhauser et al., 2003; Puhl et al., 2017; Nyiendo & Haldeman, 1986; Wyatt et al., 2005) regarding the quality of chiropractic teaching clinics have been addressed by providing a diversity of clinical placement settings and patient populations to best prepare students for professional practice.

7.3.2. Encouraged to Reflect

Previous CCE standards (2013) included an aspect of reflective practice in intellectual and professional meta-competency 7: “ Reflecting on and addressing personal and

professional learning issues and providing evidence of critical thinking skills” (p. 33).

Interestingly, this is noticeably absent in the most recent CCE standards published in 2020.

Reflection is defined as review, interpretation and understanding of experiences to guide present and future behaviour (Wald & Reis, 2010). In the HPE arena, there is a general agreement that reflection in practice should be continuous (i.e., before, during and after an event), be connected to academic and real-life needs, be challenging to prompt critical thinking, be contextualised within the course and service setting, and should involve communication with peers and instructors (Stewart & Wubbeena, 2014). Furthermore, reflection is considered essential for professionally competent clinical practice and is becoming more inherent to medical education (Wald & Reis, 2010). Reflection is also an educational practice that demonstrates the application of both the experiential and adult learning principles.

In this study, one aspect of the clinical program that stood out as requiring attention was the minimal engagement in reflective practice, which was a standard of meta-competency (CCE, 2013) at the time the study occurred. It was generally apparent that reflective practice was only minimally embedded within the curricula and was not especially embedded within the clinical program. Also, there were some perceived barriers to implementing reflection on practice in the clinical space, such as competing demands and time restrictions.

It is already known in medical education that students need designated time and motivation for reflective practice (Chaffey et al., 2012). Such barriers include a lack of time, knowledge, guidance, training, skill, experience, motivation, perceived benefits and support within the organisational culture (Miller, 2020). Studies have found that there is unease or uncertainty of reflection for medical students, where they require knowledge of how to reflect and the time and motivation for this to occur (Albanese, 2006; Chaffey et al., 2012).

Furthermore, there is a need for their educators to be explicit, stimulate student interaction, model and facilitate reflection in individualised meetings or small groups (Schaub-de Jong et al., 2011).

As far as organisation and culture are concerned, in this study, there appeared to be a poor understanding of the concept of self-reflection and reflective practice. Students perceived this as a personality trait that does not require encouragement or formality, nor was it something that could be taught. Assuringly, most students were open and even enthused by the concept of learning to reflect on practice. They thought that it would encourage a more patient-centred approach to their clinical practice, as opposed to a practitioner-centred approach. This is consistent with the thoughts of Wald and Reis (2010) regarding medical education, whereby reflection promotes informed patient-centred management that is associated with best clinical practice (Davis et al., 2005; Lévesque et al., 2013). From the nursing perspective, a person-centred healthcare agenda recognises that self-awareness and participation in reflective practice are vital (Devenny & Duffy, 2014) because they enhance self-directed learning, professional maturity and ultimately improve the quality of patient care (Tashiro et al., 2013).

In this study, students and new graduates reported that student and mentor scheduled feedback meetings every trimester were a missed opportunity to engage, teach and model with students on how to reflect on practice. Recommendation to improve this may include clinical mentors providing open-ended questions that would encourage students' reflective practice dialogue compared to the current practices of 'ticking off boxes'. Furthermore, engaging in reflection on practice can be included in near-peer interactions in the clinical setting for teaching and modelling of practice.

Regarding the application of educational theory in clinical education, according to Schon (1996), the act of reflective practice involves thoughtfully considering one's own

experiences in applying knowledge to practice while being coached by professionals in the discipline. This may include CE, mentors and near-peers. This correlates and integrates with experiential (Kolb, 1984), social (Bandura, 1997) and situated learning (Lave & Wegner, 1991) theories in clinical learning. In medical education, Wald and Reis (2010) have identified questions and issues associated with reflection, such as what it is, why it is necessary for acquiring core competencies, how it is learned and how it is assessed.

The act of reflective practice is undeniably vital for the emergent practitioner and is now widely becoming accepted for chiropractic practitioners, regardless of the stage of their career. As any learner traverses the journey from incompetent to competent, they should be mindful that this skill is an essential tool and purposefully seek out those who can guide them. The fact that teaching students to reflect on practice is not foremost in the educator's mind is opposite to the principles of Kolb's experiential-learning cycle (1984); the four distinct steps within Kolb's cycle encourage students to transform practice experiences towards professional knowledge. This has been described and displayed in Chapter 3 (section 3.5.3) and Figure 3.1.

There is a call for chiropractic clinical education to include the development of self-reflection skills, as this is an expectation of contemporary health professionals and is becoming a legal requirement for professional licensure (Wangler & Wiles, 2011). Some professional registration bodies, such as the Chiropractic Board of Australia, includes self-reflection as a component to continuing professional development requirements for registered practitioners (Chiropractic Board of Australia Ahpra, 2017). Although that is the intention, studies in chiropractic that focus on reflection as a component of clinical curricula are limited. Ebrall, Repka and Draper (2008) reported on the outcomes of an approach to clinical learning that requires chiropractic students to reflect on directed activity critically. The

perceived value of critical reflection was that it strongly contributes to a deepening of the student's clinical learning (Ebrall, Repka, Draper, 2008).

One function of reflection is that it helps to make meaning of complex situations and enables learning from experience (Mann et al.,2009). In medicine, it has been stated that other benefits include improvements in diagnostic accuracy and patient encounters, developing empathy and non-technical skills, and improving students' wellbeing (Wald & Reis, 2010). Furthermore, when reflection includes a written reflective task, the students benefit by allowing them to slow down and digest all the patient information (Wald & Reis, 2010).

To conclude, for practising health professionals, reflection appears to be stimulated by the anticipation of complex clinical problems and challenging patient situations. Some of the study participants recalled reflecting most when they had difficult or complicated patient encounters. Due to a dearth of research in this area, there is room for future studies to explore the effects of reflective practice in chiropractic students' clinical education and learning.

7.3.3. Clinical Supervision and Mentorship

7.3.3.1. Clinical Supervision

An empirical definition of clinical supervision is “the formal provision, by approved supervisors, of relationship-based education and training that is work-focused and manages, supports, develops and evaluates the work of colleague/s (precision) (Milne, 2007). Supervisors' main methods are ‘corrective feedback on the supervisee's performance, collaborative goal-setting and teaching and learning at the point of care” (Milne, 2007, p. 439). The process works towards the progressive autonomy of the supervised and aims to promote autonomous decision-making; it values the individual's protection and provision of safe care through reflective processes and clinical practice analysis, ultimately improving

professional practice (Hall, n.d.). For the development of the health workforce, it is paramount that health students are supervised by appropriately qualified and experienced health professionals (Vaughan et al., 2020). Students of chiropractic are frequently supervised by clinicians who are generally practitioners from the field of clinical practice (Beck et al., 2009); thus, the interaction between the students, the CE and patients reflects ELT, SLT and social learning theory.

A recent study exploring best aspects of supervision of nursing and allied health students and supervisors identified a need for formal structure of supervision (including formalised feedback), a clear understanding among students and supervisors about assessment expectations and an interactive learning approach with constant communication rather than a teaching approach (King et al., 2020). Some of the worst aspects included when a supervisor does not know what a student can and cannot do, and when there is no time for feedback (King et al., 2020).

In this study, the clinical program was designed as a purposely scaffolded learning model across the four trimesters through engaging students in clinical placements and providing various types and levels of supervision and mentoring. 'Scaffolding' is a term that describes the process of progressively withdrawing or changing assistance as expertise is developed. The trick to scaffolding is knowing what stage the learner is at and adjusting your instruction, teaching or facilitation accordingly (Smith & Blake, 2005).

In this study, students were supervised in ratio of one CE to multiple students in the introductory clinic, and multiple CE to multiple students in the hub and spoke clinics. In CE to student ratios in supervisory models of physiotherapy, Lekkas and colleagues (2007) found a lack of research to support an 'ideal model'. They contend that the ratio of one educator to multiple students has several advantages for students towards clinical competence, encouraging collaboration, clinical independence and active learning. Disadvantages include

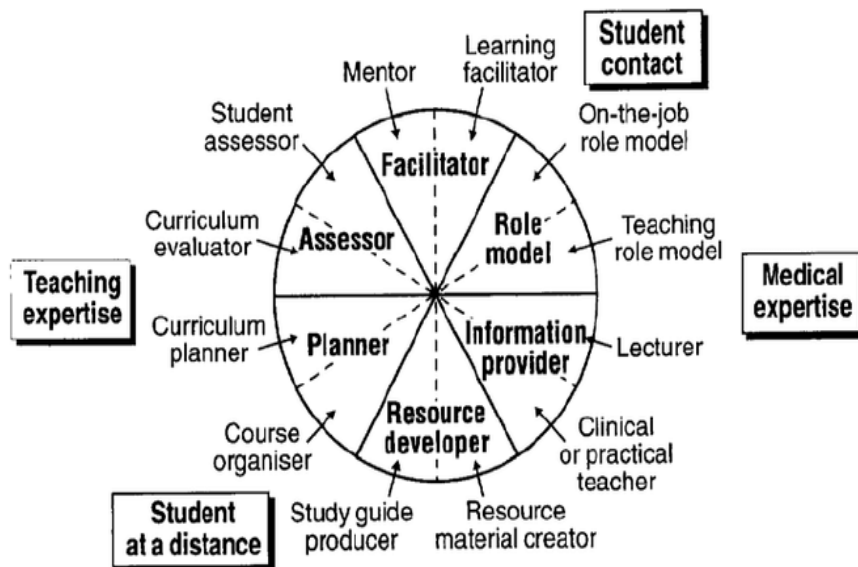
fear of inadequate supervision, limitations in patient variety and competitiveness between students (Lekkas et al., 2007). The multiple educators to multiple students model have similar advantages of fostering collaboration, students' independence, self-directed learning, autonomy, professional growth and roles within the profession and community; this is made possible because the workload is shared among educators (Lekkas et al., 2007). This model also fosters fragmentation among students and needs increased collaboration among staff (Lekkas et al., 2007). Thus, in relation to this study, the different two models used across the overall clinical program (one educator to multiple students and multiple educators to multiple students) also revealed that one model was not the ideal. The one educator to multiple students model during trimester 7 was too limited and restrictive in the educators' perspectives and approaches to clinical practice. The multiple educators to multiple students model introduced diversity and inconsistency in perspectives among the educators. Furthermore, this diversity introduced inconsistent approaches between CE and teaching faculty, such that what was provided within the curricula was not always supported or reinforced by the CE. The clinical faculty members were not always cognisant of these discrepancies, perceiving they were reasonably congruent and consistent in their approaches. Despite some of these weaknesses, CE and their supervision were mostly viewed as a strength and a value of the program; the advantages of the multiple educator to multiple students model seemed far greater than the disadvantages compared to the single educator to multiple students model. Diversity of CE perspectives was both a strength and a weakness when they would provide conflicting views, yet students still saw this as preferential to the one educator experience.

In this study, the stakeholder findings reflect the definitions of clinical supervision mentioned above. CE are required to assume numerous integral roles including, but not limited to, patient care and management, educator of both students and patients, student

mentor, role model and enforcer of clinical governance and procedures. They were also support for students' learning and development of technical and professional skills and provided emotional support. A combination of these essential roles serves to answer the objectives of delivering a doctor-driven, patient-centred, clinical care model, combined with a student learner-centred approach to clinical education situated within the CLE. A recent qualitative exploratory study of chiropractic teachers that examined the meaning and conceptualisation of the educational environment (not limited to the clinical) was that it should motivate vocational practice, model an ideal, support and manage students in stress, and include students in the community of chiropractors (Palmgren et al., 2017).

Harden and Crosby (2000) illustrate the tasks and roles of teachers in medical education into six areas of activity that encompasses the CE in a service-learning environment (see Figure 7.4).Figure 7.4

12 Roles of the Teacher in Medical Education



Note. From 'AMEE Guide No 20: The Good Teacher Is More Than a Lecturer – The Twelve Roles of the Teacher', by R. M. Harden and J. Crosby, 2000, *Medical Teacher*, 22(4), p. 336 (<https://doi.org/10.1080/014215900409429>). Copyright 2000 by Taylor & Francis. Reprinted with permission.

In terms of role modelling, it was apparent that the ‘doctor (CE)-driven model’ was the adopted supervision model across all clinical placement settings. This model was perceived as a strength and best practice of the clinical program because the CE standard of care would be observed, modelled and reinforced by students through experiential, situated and social learning experiences. Furthermore, when CE adopt best practices towards patient care, the modelling for and reinforcement by students was viewed as a positive aspect of this model. However, this supervisory model also had perceived weaknesses, as students sometimes felt restricted and limited in their hands-on engagement in patient care, intellectual contributions and decision-making for patient management. Balancing student autonomy was equally challenging for CE when the students would assume autonomy without understanding their competence and the necessity to follow proper industry requirements, standards and governance. This reinforces when students may not be entirely aware of their level of competence and want to engage above their skill level.

In the medical literature, concerns have been raised about the way in which doctor-led medical education is conducted. The role modelling of the physician is a missed opportunity for “deep collaborative working relationships between students and patients are missing” (Bleakley & Bligh, 2008, p. 89). Bleakley and Bligh (2008) called for patient-centred education that is more student-centred and individualistic, which moves away from the traditional model of patient as a secondary concern, educationally, to focus on the relationship between students and their CE. In this study, there was evidence of a patient-centred approach through stakeholders’ respect for patient-centred care in their current and future practice. Student-centred and individualistic approaches were also evident by the way students conducted patient consultations with graduated autonomy and the levels of clinical supervision and mentoring provided. The supervisee may not appreciate the process of scaffolded supervision and autonomy.

Variability was seen in the level and type of students' clinical supervision and mentorship, dependent upon the student's trimester and the type of clinical setting. For example, the more novice trimester 7 intern would experience a different level of supervision than a student in trimester 10, who is soon to transition into the profession. This supervision variability mostly applied to students in trimesters 8–10. This investigator's interpretation based on extensive experience is that it is likely due to the scaffolded approach to supervision, yet reasons were not explored in this study. These could be examined in future research.

Other CE scholars have identified different supervisory models applied to health-professional students in ambulatory care settings. For example, Dent (2005) described six models of supervision: (a) sitting-in model, (b) report-back model, (c) team member model, (d) grandstand model, (e) supervising model and (f) apprenticeship model (see Appendix N). These models vary in the students' responsibility for patient care and level of CE engagement. Students' autonomy graduates incrementally from the sitting-in model to the supervising and apprenticeship models, whereby CE assume more observership and verification. Moore (2011) provides a variant of Dent's models, the educator sitting-in model (see Appendix N). While this model may be more applicable to the examination of a student's clinical performance, it was also reportedly used by the educators in this study when they wanted to develop a close understanding of the student's skill level.

The alignment between Dent's (2005) and Moore's (2011) supervisory models and the models identified in this study at the single chiropractic institution are presented in Table 7.1.

Table 7.1

Relationship of the Supervisory Models, According to Dent (2005) and Moore (2011)

Supervisory model	Dent (2005)						Moore (2011)	
	Sitting-in model (with the near-peer mentor)	Report-back model	Tutor model	Team member model	Grandstand model	Supervising model	Apprenticeship model	Educator sitting-in model
Introductory clinic (trimester 7)	√	√	√					√
Hub clinics	√	√	√	√	√			√
Spoke clinics		√		√		√		

7.3.3.1.1. The Introductory Clinic

Models of supervision and mentoring are described in Table 7.1. Higher levels of guided student supervision and mentoring was reflected by student learners being supervised and mentored by CE (expert) and their more senior peers (intermediaries) to provide a CoP aligned with SLT and social learning theories. Students developed and adapted to their single CE's expectations, perspectives and requirements, which worked well for introducing them to clinical expectations and procedures. The bedside learning, supervision and mentoring combined with the less complex patients were appropriate to induct them before the next trimester.

7.3.3.1.2. The Hub Clinics

The supervisory models for student–patient contact in the hub clinics is shown in Table 7.1. Hub CE adopted the doctor-driven, patient-centred model of patient care, yet they appeared to be more engaged in patients' care. This model's strength was that students would have firsthand experiences with health insurance industry requirements; the deficiencies related to students' autonomy and reduced hands-on patient care. As a result, students struggled with those who did not adopt adult learner principles, which affected their autonomy and reflection of practice. The multiple educator to multiple student supervision was valued, with some initial challenges when transitioning from being assigned to one educator in trimester 7.

7.3.3.1.3. The Spoke Clinics

The spoke clinics tended to have a slight variation to the doctor-driven model, even referred to as a 'student-driven model'. Across these settings, the CE may be able to take more of a 'hands-off' approach and provide a more 'hands-on' strategy for the student, as there was no accountability to insurance companies with low cost, no fee or subsidised care. The VA sites seemed to be the exception, with more rigorous supervision and oversight of

patient consults and patient management schedules. The spoke clinics resembled a slightly more independent version of the report-back model, supervising model and team member model compared to the hub settings, as highlighted in Table 7.1.

Students were increasingly exposed to adult learning principles in action and increasing autonomy levels, which allowed them to understand the relevance of their learning for managing patient encounters. Most likely, CE altered their level and type of supervision based on improvements in students' skills, performance and competence with repeated patient care, particularly during the later stages of the clinical program. Either way, the more autonomous supervision was a positive aspect of the spoke and remote internship placement settings.

Palmgren and Laksov (2015) also found that chiropractic students saw their outpatient clinic experience as a valuable, safeguarded training environment, whereby the learning conditions permitted them to work autonomously while still under guided clinical supervision with accessible professional expertise. The judgement of the environment's quality was linked to the clinical supervisor and the types and number of patients seen (Palmgren & Laksov, 2015). In relation to this study, all these factors correlate to the experience of the spoke clinical experience.

The four theoretical frameworks—ELT, SLT, ALT and social learning theory—were reflected by the clinical care interactions between students, patients and CE across all clinical settings. When students lacked the opportunity for abstract conceptualisation and active experimentation aspects due to limited autonomy, their perception was one of dissatisfaction that they lacked ownership of the experience. The challenge apparent from this American program, and previous studies, was the delicate balance of adult learning principles applied in the CLE—the student learners' desire for autonomy and authentic experience yet requiring their clinical supervisors' support. When students were being inducted, they required more

supervision and guidance, but this approach needed graduated modification, especially towards program completion. Despite them wanting autonomy, there were times when the students may not have been fully aware of their levels of competence; an example of this was from clinics in the earlier trimesters, where the highly supervised engagements between the student and CE were warranted for patient safety. When there was incongruence between adult learning principles and learner types with the clinical supervising and mentoring, the students' reflected a negative perception of their clinical experience and their CE.

A study of Canadian physical therapy students identified that increased responsibility, or autonomy, in patient care and clinic operations reduced the perceived gap between the classroom and the 'real world' (Bostick et al, 2014). Despite students wanting autonomy, there was comfort in knowing the supervisor was available to provide support if needed (Bostick et al., 2014). Most importantly, those students' perception of their student-led clinics as a safe place to learn was due to 'supported autonomy', 'managed expectations' and 'peer support' (Bostick et al., 2014). Another study involving medical, allied health and nursing students identified the importance of autonomy in learning, professional and clinical development (Fredholm et al., 2015). The main findings from the students' narratives were that they experienced challenges in the extent of their autonomy. The students' dependence, ambivalence with their supervisor and professional belonging were connected to autonomy (Fredholm et al., 2015).

In this study, students revealed a need for more autonomy. It is well established that students will misinterpret their perceived competence, often seeing themselves as far more competent than they are when moving into the service-learning environments (Hecimovich & Volet, 2009). This study has demonstrated that further exploration of supervisory models employed in chiropractic clinical education settings is an important next step in a series of

studies into chiropractic supervision models. Student mentoring in the SLEs is discussed in the next section.

7.3.3.2. Mentorship

Kerry & Mayes (1995) describe mentoring as including “nurturing, role modelling, functioning as teacher, sponsor, encourager, counsellor and friend, focusing on the professional development of the mentee, and sustaining a caring relationship over time” (as cited in Gopee, 2011, p. 11). In these SLE, the CE were considered an aspect most valued across the three stakeholder groups. There was particular praise for the CE at the spoke sites; CE were considered exemplary and high-calibre practitioners and role models for students to model. Positive role modelling by an exemplary individual within the clinical setting can be an effective teaching strategy for the novice student (Perry, 2009). In nursing, an exemplary role model is an individual who has considerable professional and craft knowledge, and outstanding psychomotor, technical and interpersonal skills (Perry, 2009); the same description can be applied to chiropractic education and mentoring.

It is expected that through ongoing engagement with their CE, students would learn and develop their skill and art of becoming a chiropractic practitioner and create their professional identity. This reflects Bandura’s social learning theory (1997)—that most human behaviour is learned through observation and modelling. Driven role modelling in the CLE is one of the most important components in developing the students’ professional role, which fits well with situated learning (Ramani & Leinster, 2008).

Mentorship has been adopted as an approach to enhance learning in the clinical setting (Burnard, 1990) and is recognised as playing a vital role in the support and training of healthcare professionals (Bray & Nettleton, 2006). Developing a mentor relationship in a patient-care setting may be difficult for chiropractic CEs, but can be done (Stick et al., 2010).

While CE serve a purpose in overseeing students' clinical decision-making and practices for patient care and safety, they also serve as a role model, energiser, envisioner, investor, supporter, standard prodder, teacher-coach, feedback giver, eye-opener, door opener, ideas bouncer, problem solver, career counsellor and challenger (Gopee, 2008).

In this study, it was apparent that CE were not only responsible for supervising students with patients, but also for their mentoring and pastoral care. There were two types of mentoring offered to students:

- *Formalised mentoring* with students assigned to a clinical mentor. Clinical mentors reviewed students' formative and summative assessments, clinical progression and feedback across several domains. There were differing perspectives as to the effectiveness of formalised mentoring. This mostly served to monitor clinical progression, with missed reflective practice opportunities. It was a well-planned initiative but seemed limited in meeting the objectives of student mentoring.
- *Near-peer mentoring* was a recent initiative to enhance social and situated learning between senior students and junior students during the trimester 7 introductory clinic, as described earlier. The practice received somewhat mixed reactions from students: it either provided more comfort and assistance during their clinical induction or detracted from their experience. There was a benefit to both mentor and mentee's clinical and professional development, with support for the notion to continue. Similar findings to this study have been found with physiotherapy students in a systematic review that explored peer tutoring and mentoring; the authors found far more advantages than disadvantages (Lekkas et al., 2007). These included enabling students to function at higher cognitive levels, fostering positive attitudes among students about the subject matter, reducing

student anxiety and stress, encouraging lifelong learning compatible with the characteristics of adult learners and providing safe and supportive environments for analysis of emotions that arise from clinical reflection. Disadvantages were few but included no regulation of the provision of incorrect information (Lekkas et al., 2007). By far, the positive aspects outweighed the negative for both the mentor and mentee in this clinical educational relationship. Socialisation with near-peers has many benefits, but being supervised by them is another question.

On some occasions, the students' 'socialisation' was facilitated by the CE, and at other times, it was by a near-peer. Beyond the institution's mentoring, some students sought the guidance of chiropractors in the field. Whether in a formal mentoring relationship or an ad hoc mentoring relationship, it was acknowledged that the ultimate aim was to make the students' clinical transition as comfortable as possible as they enter into the clinics and the profession. Like other health and medical professions, in chiropractic clinical education, the opportunities are designed so that students can professionally socialise with other chiropractors.

While there were elements of mentoring provided by the CE in this study, there was a desire for more opportunities for students, particularly in the program's later stages. Future studies might explore the extent to which chiropractic students received educational value from being mentored and supervised by near-peers. More research is needed to focus on understanding whether the findings from other professions apply in chiropractic clinical education.

7.3.4. Feedback

According to the adult learner principles, adult learners need feedback (Knowles, 1990): "feedback is the process by which the teacher provides learners with information about their performance for potential improvement. Managed well, it provides an educational

loop through which the teacher can guide learners to use the evaluation of their performance to reassess attainment of goals” (Ramani & Leinster, 2008, p. 349). It is the quintessential component of successful experiential learning, according to Kolb (1984). Scholars in medicine and other health professions state that feedback offers the opportunity for a learner to benefit from another practitioner’s critique, reasoning, advice and support (Johnson et al., 2019).

A common challenge in clinical teaching is providing feedback and making time for discussion between the student and the educator among many competing demands. In this study, there appeared to be a conscious drive to provide quality feedback to students in the scaffolded longitudinal clinical program. Clinical faculty members perceived they were providing sufficient, genuine and quality feedback that was integral to the students’ learning of their clinical and professional skills—student feedback provided during clinical interactions and mentorship meetings with CE and near-peers. New graduates recalled receiving adequate, timely, appropriate and sensitive feedback—tailored to the individual and the situation—that would not compromise the students’ confidence in their clinical interactions. These findings contrast favourably with other studies that report a common complaint from health-professional students is that they do not receive adequate feedback (Burgess & Mellis, 2015). In this study, stakeholders reported three modes of feedback provided to students:

7.3.4.1. Formative and Formalised Feedback

In medical education, it is known that formative feedback is an integral part of the learning process and should be given regularly and early in clinical placement; this ensures students remain on target to reach their goals (Burgess & Mellis, 2015). These sessions typically refer to an educator and learner discussing the learner’s performance more comprehensively, associated with an appraisal or a workplace-based assessment (Johnson et

al., 2019), for the specific purpose of improving the learner's knowledge, skills or behaviour (Burgess & Mellis, 2015). In this study, each trimester, CE engaged in formalised observations and assessed students on their patient interactions, placing these assessment rubrics online for future reference. 'Scheduled mentoring and feedback sessions' would occur between students and designated clinical mentors (not necessarily the same CE) to review these assessments and students' attainment of quantitative patient requirements and case mix. However, these formalised mentor feedback sessions seemed to miss the mark as genuine feedback and mentoring engagement.

Proposed improvements to these formalised feedback sessions might be found by developing learner-driven contracts, with objectives revisited each trimester to reflect on their learning as to where they are, where they should be and where they should reach (Ramani & Leinster, 2008). When conducted well, feedback promotes self-reflection and self-assessment on behalf of the students (Ramani & Leinster, 2008); this was an area for improvement identified in this study, as discussed in section 7.3.2. Recent studies in medicine also report that the medical educator's analysis of the learner's performance predominates (they infrequently ask learners to self-assess or develop an action plan), and there is a need to engage students in reflective learning and goal setting (Johnson et al., 2019). Further studies in this area in chiropractic are needed.

7.3.4.2. Summative Feedback

Medical scholars write that this type of assessment means a judgement is made about the learner's performance and whether progression can occur (Burgess & Mellis, 2015). In this study, students' clinical performance was examined during formal clinical competency assessments at various stages across the four-trimester clinical program.

7.3.4.3. Informal and Ad Hoc Feedback

Medical literature states that informal feedback is often brief fragments of feedback that occur while delivering patient care (Johnson et al., 2019). In this study, students were customarily given this feedback contemporaneously to improve their patient care performance and patient safety.

Students and new graduates reported that whenever provided, informal feedback was always welcomed. This organic and mostly instantaneous feedback with patient consults was far more appreciated and valued than the formal feedback and summative assessments. This finding is congruent with the medical literature, in that feedback needs to be provided close to real-time patient interactions to be effective (Ramani & Leinster, 2008).

Some students felt that feedback reduced as they progressed in the program, which may be situational and student dependent. Clearly, there are many reasons why the time allocated for feedback needs to be purposely scheduled. Students and new graduates reported discrepancies in the quality and quantity of feedback provided to students across the clinical settings and the clinical practicum duration. While there may be variations for a plethora of reasons, there is a need for consistent delivery, no matter how junior or senior the students are. Typically, in any clinical education setting, when students show competency and capability, the need for supervised practice and resultant feedback may reduce. That said, known barriers to feedback in medical education and nursing is the lack of direct student observation by their CE (Burgess & Mellis, 2015; Ramani & Leinster, 2008), inadequate supervisor training and education (Clynes & Raftery, 2008; Johnson et al., 2019) and insufficient time spent with students (Clynes & Raftery, 2008). Furthermore, the skills in giving and receiving feedback are rarely taught to clinicians (Burgess & Mellis, 2015). Burgess and Mellis (2015) include recommendations for providing feedback on clinical placements, such as direct observation, asking the learner for self-assessment, being

constructive, providing specific details towards improvements, limiting feedback to two or three specific details, preparing a plan to achieve improvement, checking the student has a clear understanding of what and how to make improvements, planning another observation and feedback session, and documenting. Beckman and Lee (2009) recommend FITABLE feedback, which stands for frequent, interactive (between teachers and learners, and self-reflection), timely (immediate is best), appropriate for the learner level, behaviour-specific and balanced, labelled and empathetic.

Inferences taken from this study is that CE may benefit from training on how best to provide feedback in the clinical settings and how to successfully facilitate mentoring sessions. Topics in the faculty training might include self-assessment, student reflection and development and implementation of action plans or individualised learning plans. Future studies may explore these matters more deeply.

7.3.5. Interprofessional

The accepted definition of IPE by the Centre for the Advancement of Interprofessional Education suggests that IPE occurs ‘when two or more professions learn with, from and about each other to improve collaboration and quality of care’ (Barr, 2002, p. 17). According to the relevant CCE Accreditation Standards (2020), meta-competency 8, “inter-professional education’, includes that ‘students have the knowledge, skills and values necessary to function as part of an inter-professional team to provide patient-centred collaborative care. Inter-professional teamwork may be demonstrated in didactic, clinical or simulated learning environments” (CCE, 2020, p. 28). Findings from the stakeholders indicate that the level of IPE provided from student placements across several variations of interprofessional clinical settings and experiences would meet this standard of meta-competency 8.

Concerning this study, the program website details that their clinical program has an integrative approach. Scholars in complementary medicine and medicine define integration as:

an interdisciplinary, non-hierarchical blending of both conventional medicine and complementary and alternative health care that provides a seamless continuum of decision-making and patient-centred care and support. This collaboration is by consensus building, mutual respect, and a shared vision of health care that permits each practitioner and the patient to contribute their particular knowledge and skills within the context of a shared, synergistically charged plan of care. (Boon et al., 2009, p. 716)

Within this study, there appeared to be little formalised IPE, IPL and IPP within hub clinics, despite opportunities with other co-located health disciplines. While these settings were perceived as an IPP and IPL experience, students portrayed this as a relatively segregated clinical setting that lacked formal interprofessional structures. Students' referrals for co-management or direct referrals to other health practitioners and disciplines, and not necessarily to those within the same setting, were the most common IPP. Few students felt they did not know enough about other health professions to make appropriate referrals. Yet this was a worthwhile exercise for them to learn professional practice attributes and communication between other health practitioners. In the hub settings, students' depiction of IPP was mostly informal and student-initiated, whereby they felt poorly supported to engage.

The spoke and remote internship settings offered more opportunities and variations of IPL and IPP experiences. Often, this was due to the complex patients requiring referral to or co-management with other health professionals. Students would observe their CE engaged in IPP. Hospital and VA settings included further student experiences with journal clubs, grand rounds, practitioner discussion on patient management, referrals between professions, shared

electronic health records and hallway discussions. However, without formalised arrangements, sometimes only the more confident students would pursue these further interprofessional experiences. The level of these interprofessional engagements would meet the accreditation standards required of CCE meta-competency 8 (CCE, 2020).

In this study, a common theme among all the stakeholder groups was that they were experiencing a more mainstream integration of the chiropractic profession among medicine and allied health professions because of these interprofessional experiences; professional boundaries and bias against chiropractic were minimised. Walker (2016) encouraged chiropractic students' clinical education within hospital settings to promote legitimate partnership and respect between health professions.

Overall, there was praise for the interprofessional experiences provided as a part of the clinical experience in specific clinical settings, a strength of the clinical program. Missed interprofessional opportunities were due to a lack of formal arrangements. Those who felt most competent towards post-licensure IPP were those who engaged in the remote internship program. The hospital and VA settings' IPP and interprofessional culture were far above their interprofessional experiences as a current practitioner in the private practice setting. This resembles the Danish chiropractic program that is fully integrated with the Bachelor of Medicine. A study of 166 Danish chiropractors found that while the majority (96%) considered IPP as 'very' or 'extremely' important, only 69% felt their current approach to practice was interprofessional (Myburgh et al., 2014). The IPP trends were unlikely to represent a sophisticated, team-oriented healthcare service delivery (Myburgh et al., 2014). Analysis of new graduate professional demographics from this study revealed that most were uniprofessional, with few in an IPP setting. Most interprofessional engagements occurred through written correspondence with health professionals.

The clinical program's interprofessional experiences did not resemble an integrative approach or model compared to the definitions of Boon and colleagues (2004); however, they would reflect parallel, consultative and collaborative interprofessional experiences (Kinnaman & Bleich, 2004; Boon et al., 2009). The findings in this study suggest that there is room for more formalised coordination and implementation in the curricula and clinical placement towards an integrative model (Boon et al., 2004). Future studies can explore these matters.

7.4. Being Evidence-Based

7.4.1. Evidence-Based Practice

The CCE standards' meta-competency 6, 'information and technology literacy' (2020) states: "information literacy is a set of abilities, including the use of technology, to locate, evaluate and integrate research and other types of evidence to manage patient care" (p. 27). In osteopathy, it has been noted that EBP encourages best practice, and best practice is developing EBP graduates as critical thinkers, patient-centred practitioners who integrate knowledge with clinical expertise and patient values to deliver holistic patient care (Fryer, 2008). Scholars in medicine advise that to embed EBP within both the educational and clinical setting, healthcare education programs should provide students with access to EBP mentors, journal clubs, grand rounds and research meetings (Lehane et al., 2019).

The literature shows there are five components to EBP:

1. ask a searchable question about how to help a particular patient;
2. acquire information by searching for the best evidence in peer-reviewed literature and high-quality resources;
3. appraise the results, of the best evidence and relevant information to the patient and/or clinical setting;
4. apply the evidence to the patient and/or clinical setting; and

5. assess patient care (Johnson, 2008).

From this study, it was apparent the program was equipping students with the necessary self-directed learning and skills for appraising and applying the evidence to patient care. This was well aligned with CCE's meta-competency 6. There was a culture of EBP across the curricula and implementation by CE and students in service-learning environments with the utilisation of the relevant research. All stakeholders regarded the application of an EBP approach to clinical practice as a strength and an aspect of best practice of their clinical program.

However, there were some inconsistencies in the utilisation of EBP across the four trimesters and clinics. Variations in some of the standards and expectations of EBP depended upon the clinical setting and the CE. The hospitals and VA settings reportedly had a comparably higher standard and expectation of referring to the research in the EBP approach for patient care. It was reported that specific treatments could not be applied if there was not sufficient evidence available. The utilisation of literature took precedence over the practitioner's clinical experiences and patient preferences. Arguments have been made about how techniques and practical application of EBM may limit patient choices when used to direct rather than inform patient care (Rogers, 2002). Furthermore, it is well known that non-propositional knowledge and professional craft are components of EBP (Rycroft-Malone et al., 2004), but this may not have equal weighting or emphasis across many of the clinical settings and participant responses.

Students and new graduates reported that sometimes it was not the setting, but the CE who reportedly had higher expectations for clinical justification of care and would ask a clinical research question requiring students to utilise the literature. Some educators seemed more skilled in their research skills and using these components as a part of their own and the students' clinical practice. Despite the varied and non-standardised approaches, EBP was a

reported strength of the clinical program. Students felt they would continue an EBP ethos in their future clinical practice, in particular, referring to the literature in their clinical decision making. This, they felt, was something that distinguished them from other chiropractic practitioners in the field. Ten years ago, chiropractic authors claimed there had been little published regarding the most effective strategies for training chiropractic students in EBP (Banzai et al., 2011). At a similar period, chiropractic scholars at the University of Western States developed their seed document in specific EBP competencies for clinical competencies of chiropractic students (LeFebvre et al., 2011). Shreeve's (2012) study found that there were deficiencies in the chiropractic students' utilisation of all five steps of EBP. Previous commentaries and criticisms of chiropractic programs have been for not providing EBP in their curricula or clinical education (Murphy et al., 2008; Walker, 2016; Wyatt et al., 2005). Methods that have been proposed specifically for chiropractic include interns having formal academic sessions devoted to learning the necessary skills of critical appraisal, recruiting doctors who practice evidence-based chiropractic into teaching roles, sharing of approaches to teaching EBP among faculty and providing faculty with feedback on their performance as role models and teachers of evidence-based health care (Banzai et al., 2011). From the data, it appears some of these elements were within the curricula and the clinical faculty profile.

Medical scholars claim that the implementation of EBP education is necessary so that learners can be competent in the fundamental steps, which will then likely influence their behaviour in terms of clinical decision-making in their professional practice (Lehane et al., 2019). Lehane and colleagues state that it is necessary for EBP principles to be integrated throughout all elements of the curricula; this is essential to the students' successful learning and practice outcomes. They identified three main categories of EBP in any curricula: (a) 'EBP curriculum considerations', (b) 'teaching EBP' and (c) 'stakeholder engagement in EBP education'. The curriculum should include the cycle of asking the clinical question

through the application of the evidence in patient care and being proficient in communicating this evidence with the patient to facilitate shared decision-making (Lehane et al., 2019).

These strategies are also likely to be effective in chiropractic education.

In this study, new graduates and students had the motivation, positive attitude and perceived competence towards EBP. This contrasts with the findings from a multi-institutional survey of chiropractic students from North America, Australasia and Europe that measured students' basic knowledge, skills and beliefs about EBP (Banzai et al., 2011). While students had relatively positive attitudes towards EBP; they felt they needed more training in EBP on basic research concepts—they still lacked an appropriate skillset and competence (Banzai et al., 2011).

Even though there was some variation with higher expectations in the application of EBP dependent upon certain clinical settings or the educator, this chiropractic program had a clear intent to establish an agenda of EBP in both the formal, theoretical curricula and in clinical education. This American institution seemed to be providing at a level expected of a graduate within the private practice setting, whereby students and new graduates felt the application of EBP was part of their clinical and professional skills and behaviour. However, this seemed more heavily emphasised in one element of Sackett's (1996) model being the utilisation of the relevant research and lesser weighting of clinical expertise or patient preference.

7.4.2. Evidence-Based Education: Educating the Educator

The aforementioned clinical supervisors' varied approaches to applying EBP may stem from a lack of adequate preparation for some roles. The delivery of EBE, whereby CE have the appropriate teaching skills for their roles, was discussed by the CE and alluded to by the other stakeholders. Some educators felt they were not as knowledgeable about

educational theories and how to be an educator. In contrast, others felt the institution supported them well in their efforts to learn and upskill to become an educator and to further their postgraduate qualifications. Other authors found that while clinicians are responsible for most of the students' clinical training, there is a lack of specified standards for their education and training role (Johnson et al., 2019). Authors in other health professions claim that when it comes to providing positive learning in the CLE, there is a need for high-quality clinical education staff who are suitably trained for the task and adequately resourced and prepared for the role of an educator (Darcy Associates, 2010, 2016). Those authors also claim there is a need for the skill, knowledge and competency of clinical staff with ongoing skill development and regular review of their clinical practice. Furthermore, the individual needs to adopt the best evidence into practice (Darcy Associates, 2016).

In this study, there appeared to be discrepancies between curricula content and what CE permitted to be implemented in the patient management in the teaching clinics. However, to overcome this difficulty, academics created student and educator manuals with clinical care protocols for the teaching clinics to standardise clinical teaching and encourage consistency between the teaching and clinical environment, and teaching faculty and CE.

One element of best practice CLE is effective communication processes between CE and the provider-based and academic educators (Darcy Associates, 2016). Effective communication (both written and verbal) will improve teaching and learning through the exchange of resources, information regarding curriculum content, learning objectives and explanations of assessment (Darcy Associates, 2016). A previous study in physiotherapy identified that inconsistencies ensue in clinical supervision when a common philosophy is absent for clinical education (Strohschein et al., 2002). Inconsistent approaches among clinical supervisors come from the lack of adequate preparation across their various roles. Years of clinical practice experience does not equate to being a great clinical teacher or

expertise in CE roles; given that the quality of teaching affects student learning, adequate educator preparation is a necessary component (Strohschein et al., 2002).

Chiropractic students are usually supervised by skilled field practitioners, not trained educators who can introduce unique styles (Beck et al., 2009). Training of CE has been a concern of other chiropractic programs; for example, an Australian chiropractic program recognised difficulties when CE are separate from the teaching faculty (Ebrall, Draper, Repka, 2008). CE often lack mentoring, training and professional development for their roles, and this, when combined with limited interaction with teaching faculty to share the curricula, affect educational outcomes (Ebrall, Draper, Repka, 2008). A resultant “dilution or filtration of the curricula, which can perversely force students to adopt what may be a new and contradictory set of principles and methods according to what individual clinical educators may be comfortable with from their own educational experience” (Ebrall, Draper, Repka, 2008, p. 158). This potentiates a students’ clinical learning driven by the individual clinician’s experience, whereby the contemporary, informed views of the academic group are diminished or even excluded (Ebrall, Draper, Repka, 2008). To overcome this problem, Ebrall and colleagues (2008) devised educational training for CE to integrate the curricula content and how theories of appropriate pedagogy are applied across the curricula.

In this study, no attempt was made to ascertain the basis on which CE were engaged in their role, nor their educational qualifications to become CE. However, it was observed that there was variation among participants of senior educators with additional degrees, and some recent graduates engaged in this role. It is further noted that respective to chiropractic clinical education in general, there are no meaningful selection requirements for the CE position other than professional registration, with some institutions requiring a minimum number of years of vocational practice (Ebrall, Draper, Repka, 2008). While registered chiropractic practitioners are required to take continuing professional development annually,

and one of the options for continuing professional development is to undertake training in clinical education, there is a dearth of CE programs specific to chiropractic, in this author's experience.

Other authors have identified two topics that ought to be included in the curriculum to prepare chiropractic CE: adult learning principles and learning types (HETI, 2012; Rogers et al., 2010). Further, educators should be skilled in how to plan learning experiences for the student and how to assess students against their learning goals (Rogers et al., 2010). Moreover, improving their knowledge and skills across current evidence in clinical education, providing constructive feedback, facilitating reflective practice and clinical reasoning, and utilising broad-based evidence to inform practice are concepts in which CE need training (HETI, 2012, p. 57). Educator's skills and knowledge need to be beyond patient care—merely wanting to be a teacher is not enough (Baldry Currens & Bithell, 2000; Rogers et al., 2010).

In this study, even though there were elements of EBE in the clinical program and among the CE, there were still many challenges and areas for further improvement. There is a need to implement changes to provide consistency across teaching and clinical faculty. Future studies are needed that explore the effects of chiropractic CE training and the student experience, and ways to bridge curricula and CE and patient management. While there are studies regarding chiropractic students and EBP, there is an urgent need for studies that focus on the skills and utilisation of CE and EBP in student-led clinics.

7.5. Business Preparation

A chiropractor's most typical practice arrangement is as a solo practitioner (sole proprietorship), an associate or a partnership arrangement. Typically, chiropractors do not operate in the public health system of hospitals and community settings (NBCE, 2020). For

this reason, chiropractic graduates require capabilities and confidence as business people and the mindset of an entrepreneur (Ciolfi & Kasen, 2017).

According to the CCE Accreditation Standards, the only required competencies related to business knowledge and skills are that the curricula prepare students to “comply with regulatory standards and responsibilities for patient and business records” (CCE, 2020, p. 26). These standards are widely considered minimal to the actual skills required as a graduate practitioner (Ciolfi et al., 2020; Ciolfi & Kasen, 2017). Previous studies have confirmed that there is a gap between what is provided in chiropractic curricula and what is required as a practitioner (Ciolfi et al., 2020; Ciolfi & Kasen, 2017; Gleberzon et al., 2012; Henson et al., 2008), with similar findings identified from this study.

7.5.1. **Lack of Business Acumen**

Across all stakeholder groups, there was a commonly held perception that students' competency and proficiency in business skills and knowledge were areas of weakness and were, thus, regarded as a gap in the clinical curricula. Over a decade ago, it was stated that chiropractic educational institutions should concentrate on the clinical program, with limited attention to the business aspects, such as business and marketing skills (Henson et al., 2008). In this study, all stakeholder groups reported that despite being exposed to business theory and principles in the classroom, there was a deep concern about the relevance of content and curricula for future professional needs. The few examples where student participants felt confident in their business skills, was because of a prior business background. The majority of new graduates felt they lacked knowledge in critical areas such as industry and insurance requirements, small business requirements, clinical documentation, appropriate coding and billing. Due to errors encountered in practice, it was necessary to seek guidance from seasoned practitioners.

It was not clear from the data of this study whether this apparent lack of business acumen was because the participants may not have realised the relevance of the business content delivered until they had graduated. Even though there may have been sufficient exposure in the curriculum, there may be other elements to consider. Alternatively, they may be self-appraising a lack of skills or an issue of confidence. A recent commentary on chiropractic graduate competencies stated that newly licensed chiropractors who have already acquired business knowledge would reduce on-the-job training and would gain skills by trial and error (Ciolfi et al., 2020). Furthermore, business education in chiropractic schools contributes minimally to the business skills needed to practice within the profession (Ciolfi et al., 2020). Gleberzon et al. (2012) identified a lack of consistency between chiropractic programs regarding a comprehensive education model for business and management.

In this study, the inferences from the stakeholder groups are that knowledge and experiential learning regarding the elements and practicalities of building and running a business, developing a patient base, patient referrals, marketing and front of house administration was missing from the clinical curricula. For example, the business-related aspects in some of the spoke settings, such as the hospitals and VA clinics, did not necessarily reflect business-related aspects of private practice. However, the hub student teaching clinics' business and operational tasks are likely similar to those of private practice. Despite this, there was a definite lack of formalised and standardised student experiences in these settings, and only the more confident or astute learner would pursue additional tutelage to learn these skills during their clinical placement. Within many of the hub and spoke settings, experiential learning in the daily operational tasks such as reception, billing and coding of patient consultations, handling clinical records, documentation and dealing with insurance companies should be an inclusion. Therefore, it can be concluded that social, situated and experiential learning in these skills was not consistent or standardised.

For that reason, across the three stakeholder groups, the most forthcoming recommendations towards improvements of the clinical program included a stronger focus on business aspects. Two options proposed were:

- obtaining business course credits externally from another tertiary institution
- changing the timing and mode of delivery of business courses to enhance students' engagement by making it more interactive and experiential within the teaching clinics, with field practitioners and in class-based learning.

The distance learning provided at the end of the program was minimally engaging, and didactic learning in the classroom or online medium has its limitations.

Other chiropractors have claimed that the timing of the delivery of business courses is an important factor in the likelihood that students will absorb and retain the content; this is more of an issue when business courses are delivered simultaneously with difficult technical courses (Henson et al., 2008). Henson and colleagues (2008) suggested that chiropractors had knowledge needs in accounting, marketing and finance. Overall, the suggestions for improvements from this study concur with authors who claim that opportunities that are largely available for the graduate chiropractic practitioner to upskill in business aspects are often external to chiropractic institutions. These include professional associations, web-based learning, mentoring, books, 'trial and error' and educational opportunities outside those tailored to the profession (Henson et al., 2008). The inclusion of 'internships with a focus on business instead of patient care' may be added or, alternatively, 'postgraduate training for students and graduates external to the chiropractic institutions' is the best solution (Henson et al., 2008).

A recent review of five chiropractic programs found that of the 4200 hours of instruction required, those dedicated to business is, on average, 138 hours, ranging from 50 to 227 hours (Ciolfi et al., 2020). Ciolfi and colleagues (2020) revealed that the requirements for

education in business skills for Ontario-based chiropractors are both broad and essential, embracing most major business domains, including accounting and finance, organisational behaviour and human resources, legal and ethical issues, strategic management, managerial decision-making and operational management. Revealing similarities to the findings of this study, Canadian participants opined that including business education earlier in their chiropractic education would be helpful in acquiring the knowledge required to operate a business, and experiential learning in a chiropractic clinic would be helpful. To produce chiropractors with entrepreneurship skills requires enhanced business education in chiropractic schools (Ciolfi et al., 2020). Of interest, the USA-based Institute of Medicine (Institute of Medicines (U.S.) Committee on the Health Professions Education Summit, Greiner & Knebel, 2003) state that the core competencies that all health clinicians, regardless of discipline, should possess to meet the needs of the 21st-century healthcare system include providing patient-centred care, working in interdisciplinary teams, employing EBP, applying quality improvement and utilising informatics (Institute of Medicines (U.S.) Committee on the Health Professions Education Summit, Greiner & Knebel, 2003). There is a noticeable absence of knowledge and skills in business and entrepreneurship.

There has yet to be a chiropractic study that demonstrates that the regular programs are providing business skills and knowledge in their program to adequately prepare the graduate with the business skills needed for the profession or entrepreneurship (Ciolfi & Kasen, 2017; Ciolfi et al., 2020; Henson et al., 2008). For that reason, the tentative conclusions from this study suggest a need to adjust the curricula in regard to developing graduate business acumen. Future studies may explore this option.

7.5.2. Semidependent Employment

The findings from this study confirm previous studies that show students' development of the necessary competences in business principles needed within private practice, and as an entrepreneur, was lacking (Henson et al., 2008). A lack of experiential and situated learning seemed to have an unwanted effect on their business skills development and graduate preparedness for independence in practice. Poor perceptions of their business acumen influenced the student and new graduate participants' professional opportunities towards semi dependent practice arrangements; they did not feel confident in establishing their clinics. New graduates sought further mentoring from the profession. They felt poorly equipped to know the appropriate third-party requirements that would allow them to be reimbursed for their services, which is disappointing if they lack relevant skills for standards of practice. To bridge their deficiencies, most opted into a semi dependent employment arrangement within an existing practice among other chiropractors.

It is important that future studies explore the extent to which chiropractic students have an opportunity to engage in learning activities that truly reflect the full scope of practice of a chiropractor as a clinician and as a business person and business owner.

7.6. Conclusion

The four theories of social learning (Bandura, 1986, 1997), situated learning (Lave & Wenger, 1991), experiential learning (Kolb, 1984) and adult learning (Knowles, 1990) were the applied conceptual frameworks for this study. The relationship of these theoretical frameworks to the findings indicate how interconnected and instrumental these concepts are to the design and delivery of clinical education and the students' acquisition of their clinical and professional practice skills for graduate preparedness. There were areas where the curricula and clinical education were providing practical clinical experiences that met many

of these underpinning frameworks; such as the scaffolded program and the students' supervision and mentoring through situated and social learning. Then there were examples of incongruence between these theories and the clinical program, such as their knowledge and development of business skills and student engagement in reflective practice. These four theories allowed for the exploration and analysis of the stakeholders' perceptions according to the research objectives and questions, and highlighted the importance of referring to these theories for the design of a clinical program. Previous chiropractic studies have acknowledged the importance of a learner-centred approach to adult-based learning to increase student' commitment to learning and providing an opportunity to apply the learned concepts or skills (Shreeve, 2008).

While this North American program provided extensive allocation to experiential learning in the latter stages of the program, areas for refinements included the quality of these experiences; some clinical experiences were profound, but others were not as engaging. There was also the need for more experiential learning during the early phases of the program to enhance students' learning and engagement. Experiential learning meets adult learners' needs by creating a more rewarding and energising learning environment (Shreeve, 2008).

This study has addressed some of the known gaps in the literature on chiropractic clinical education. We now know the importance of having experience in a variety of clinical placement settings; having a team of CE who have diverse backgrounds, experience and approaches to educating students; focusing on the development of students' contemporary clinical and professional practice skills and business skills; valuing IPE, a significant component of a scaffolded clinical program; incorporating evidence into practice; and focusing on business curricula. These elements contribute to students' development of clinical practice and professional skills and competencies.

The following chapter will explore the study conclusions, recommendations for improving the clinical education components of DCP, strengths and weaknesses of the study and future research recommendations.

Chapter 8. Thesis Conclusions and Recommendations

8.1. Introduction

This final chapter presents the overall conclusions for the entire thesis. The study was designed to determine (a) the aspects of the clinical education program that develop students' clinical practice skills, (b) the effects of clinical placements, (c) the components of the clinical program that stakeholders do and do not value and (d) their perceptions of best practices in clinical education. The study has been conducted using a EDQ design, and involved three data collection phases with stakeholder groups: clinical faculty members (Phase 2), students (Phase 3) and new graduates (Phase 4) of an American chiropractic institution. Data were thematically analysed manually using an inductive and deductive process. This study's outcomes have shown the importance of a well-designed clinical program with a strong focus on a longitudinally scaffolded program—with a focus on the quality and diversity of clinical placements and types of settings—and the effects of CE on students' graduate preparedness.

Previous authors have stated that there is a need for chiropractic education to move beyond clinical training in stand-alone college clinics and health centres (Kearney & Van Dusen, 2003). This study confirms these statements—the traditional chiropractic teaching clinical model may provide a less than exemplary experience for graduate preparedness. The clinical placements were the centrepiece to the quality and authenticity of the students' clinical experiences that prepared them for the acquisition of their clinical and professional practice skills. CE were imperative to students' development of clinical and professional skills and professional identity. Having CE who are trained in and follow EBP encourages students to adopt similar EBP strategies; this is important to the implementation of EBP in the care of patients in both the CLE and in the students' future practice. The educational

strategies consisted of scaffolding learning across supervision and mentoring, clinical placement setting and patients, IPE and IPP, and reflective practice; these were all important in the students' acquisition of their competencies of practice.

Chapter 2 clearly showed an acknowledgement in the chiropractic literature that clinical education is integral (Ebrall et al., 2009; Humphreys & Peterson, 2016; Wyatt et al., 2005). Despite this, very few recent studies have examined the clinical education of chiropractic students (Humphreys & Peterson, 2016; Puhl et al., 2017). Furthermore, recent studies have shown that there is a gap between what is provided within chiropractic education and what is required in specific competencies for professional practice (Pulkkinen & de la Ossa, 2019). Academics have called for studies to examine what is provided in chiropractic clinical education that develop the necessary clinical skills and competencies for professional practice (Pulkkinen & de la Ossa, 2019). This study has explored elements of clinical education to address this gap. These have included (a) the importance of a scaffolded clinical program for chiropractic students' development of clinical competencies; (b) the significance of varied clinical placements and CE in the development of students' clinical and professional practice skills; (c) the importance of providing IPE, IPL and IPP in chiropractic clinical education; (d) the difference in the student experience in hospital placements; (e) provision of EBP across the overall curricula with implementation in the clinical setting; and (f) the effects of EBE theories on teaching for CE and the student experience.

The study's significance lies in the development of knowledge that can inform multiple chiropractic bodies and organisations to build upon an essential component of chiropractic education (clinical skill development), for which there is currently minimal research. The research findings and recommendations can potentially improve the provision of chiropractic clinical education for students and improve the profession overall by enhancing the quality of care provided to patients. Thus, through the dissemination of

findings in publications and conference presentations, this study has already contributed to both local and international chiropractic education.

8.2. Implications for Chiropractic Clinical Education

While one objective of chiropractic education is to cultivate clinical confidence in novice practitioners (Boysen et al., 2016), many other objectives must be met for the graduate to practice independently. Integral to this is the alignment between the curricula with expectations of professional practice (Ebrall et al., 2009). The educational content must encompass students' attainment of clinical skills and competencies as well as professional, business and entrepreneurial skills; this is because of the high likelihood of graduates' professional employment being within the private practice setting. Chiropractic programs that align and have relevance and authenticity to the expectations of professional practice will assist their graduates in the transition to practice. This may even affect reprimands and professional attrition.

This thesis identified at least eight elements of best practice in chiropractic clinical education that enhance students' clinical practice skills and competencies for graduate preparedness. These are conceptually presented in Figure 8.1.

It is recommended that chiropractic institutions employ these elements and design their clinical program according to the four educational theories, as conceptually presented in Figures 8.1 and 8.2, as discussed in this chapter

Figure 8.1

Eight Elements of Best Practice in Chiropractic Clinical Education, Guided by Educational Theories



Note. CE- clinical educator, EBP- evidence based practice, IPE- interprofessional education, IPL- interprofessional learning, IPP- interprofessional practice.

The underpinning educational theories with the elements of best practice in chiropractic clinical education are further explained in sections 8.2.1–8.2.9.

8.2.1. Educational Theories

This study's clinical program was reviewed against four theoretical frameworks in two categories: (a) theories that describe students' approaches to learning—adult learner principles and (b) theories that describe the importance of students' engagement with professionals of their discipline—SLT (Lave & Wegner, 1991), ELT (Kolb, 1984) and social learning theory (Bandura, 1971, 1986).

8.2.2. Theories That Describe the Student's Approach to Learning

ALT posits that adults bring experience to the learning setting that educators can use as a learning resource for all students. From this study, the employment of ALT and adult learning principles was important for how students engaged and learned within the CLE. There were elements that compromised or minimised the engagement of ALT. The doctor-driven model did not align with the aspects important to ALT, for the reasons that adults tend to be more self-directed, autonomous and internally motivated to learn (Collins, 2004; Learning Theories, n.d.). Adults need practical material and applications to meet their preference for active/experiential participation and need to be provided with timely and appropriate feedback (Collins, 2004). The clinical expectations included minimal engagement in reflective practice, and there was a desire for more feedback across the entirety of the clinical program.

Based on these elements, CE and leaders should design their clinical program, structure, supervision, mentoring and assessments around adult learner principles. Program implementation should include a complement of experiential learning and feedback opportunities and loops, and encourage effective relationships with peers and educators with graduated autonomy. CE need to engage in meaningful feedback for all students across all

periods of the clinical program. Feedback should occur across various mediums, such as formal and informal interactions, and formative and summative assessments.

Following feedback, students need to engage in reflective practice across their clinical education. This is a professional expectation and essential to their professional skills for their current and future practice. Students and CE/mentors can engage in learner contracts, such as setting learning goals and review of outcomes at the completion of each trimester/semester of their clinical placement. Other reflective practice exercises can include student-driven initiatives between peers and inclusion of more reflective tasks and assessments through written, assessed or voluntary activities, such as journaling or developing a portfolio throughout the clinical program. Encouragement by supervising and mentoring clinicians can drive this practice. Scheduling opportunities for CE to lead guided reflection with students—during briefing and debriefing before and after clinic shifts, self-appraised clinical evaluations and more-meaningful feedback sessions with their CE and mentors—will enhance implementation.

Student mentoring is a developmental component of their clinical and professional skills. Student mentoring can be informal, but formal mentoring is important for consistency across all students, as the less-confident or more-reserved student may not solicit feedback. To encourage student reflection, formal mentoring needs the inclusion of open-ended questioning and dialogue between the mentor and student, with reflective exercises, dialogue or student portfolios. Adult learners prefer facilitating discussions over transmitting knowledge (Beckman & Lee, 2009); open-ended questioning is preferred because closed-ended questions do not encourage students' critical thinking. Mentoring sessions need to include reflection and actions, not limited to checking off tasks or knowledge transfer. Formalised mentoring and near-peer mentoring should be a part of the program to embrace the many benefits to both mentors and mentees (Lekkas et al., 2007). Proposed

implementations include students developing their own clinical portfolio against the required CCE meta-competencies. This would consist of evidence pieces and critical self-reflection to focus on their clinical skills and professional development, rather than meeting patient quotas and seeing patients as numbers. Such a portfolio would be developed in partnership with their clinical mentor.

8.2.3. Theories That Highlight the Importance of Students Having an Opportunity to Socialise with Professionals in the Professional Setting, and the Importance of Role Models

ELT proposes a four-stage cycle of learning by which students enter the learning cycle at (a) concrete experience, (b) reflective observation, (c) abstract conceptualisation and (d) active experimentation (Kolb, 1984; see Figure 3.1). The four guided stages of experiential learning provide a holistic perspective that combines experience, perception, cognition and behaviour. This was represented in the themes of ‘clinical preparation’, ‘business preparation’, ‘guided learning in clinic’ and within the subthemes of ‘clinical placements’, ‘encouraged to reflect’ and ‘clinical supervision and mentorship’, ‘IPE, IPL and IPP’.

Social learning theory suggests that people learn from each other via attention, retention, reproduction and motivation (Bandura, 1977). Social learning theory was evident across the themes of ‘clinical preparation’, ‘guided learning in clinic’ and ‘being evidence-based’. The numerous examples and representations were from the doctor-driven model, clinical supervision and mentoring from CE and peers. More social learning engagements could be included in the preclinical period of the programs’ IPL, IPP and business skills and preparation within the clinical setting.

SLT emphasises the importance of CoP such that the students’ knowledge and learning should be in an authentic setting with guidance and encouragement (Drew, n.d.). In

the clinical setting, students engage in LPP in their CoP, which assists in the development of their professional identity (Lave & Wegner, 1991). As with social learning theory, SLT was well represented across similar themes and subthemes mentioned. However, the limitations included the authenticity of some of the clinical settings, the business learning and practices within the clinical settings, and the minimal IPE, IPL and IPP within the CLE.

This study showed that ELT (Kolb, 1984), SLT (Lave & Wegner, 1991) and social learning theory (Bandura, 1977, 1986) are essential components of clinical education in the latter periods of a chiropractic program. Aligned with these educational theories are several points important to best practice in clinical programs. While there was evidence of the three social-based theories within the clinical program of this study, few elements of the experiential-learning cycle were represented ideally. The doctor-driven model of supervision impeded active experimentation and reflective observation of the student. When the clinical supervision became more independent and autonomous at the spoke settings, this encouraged the elements of the experiential-learning cycle, as did the formal and informal feedback provided as close to the performed action and experience as possible. Learning-based activities for business preparation in the SLE lacked grounding in the three social theories. There was an opportunity for more interprofessional, experiential activities in the clinical setting where other health professions and students were placed.

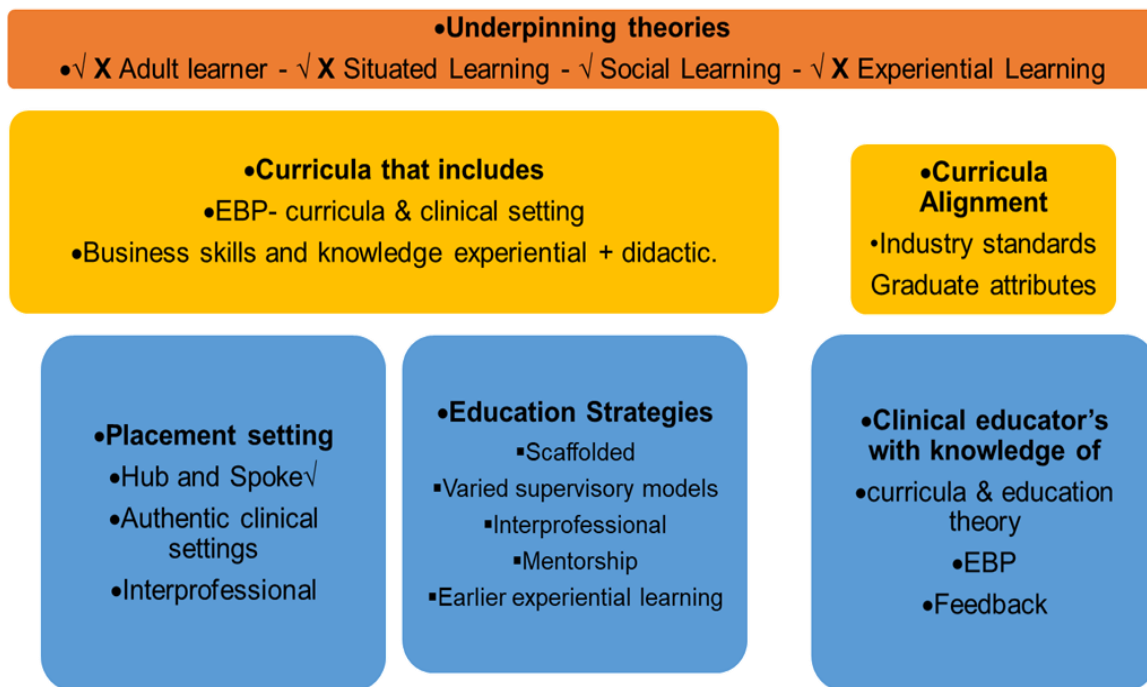
Ideally, students should have experiential-learning activities during the preclinical period across a variety of clinical settings. When possible, this would include hospital access for the authenticity of this setting and experience with patients that are likely to be complex. By doing so, preclinical students observe within authentic clinical environments and are integrated with their CoP of senior peers and chiropractic practitioners. CE and practitioners can use the grandstand model (Dent, 2005) of student engagement with patients when students are too junior to be responsible for hands-on care.

Simulated learning is another educational strategy across the three social education theories that may assist with students' development of clinical and professional skills in addition to direct patient interactions. Simulations can assist in some areas where real-life interactions may be difficult, such as the business aspects of practice and complex clinical patient presentations, or specialty populations they are unlikely to see in the clinical setting.

A program that contextualises their framework around the three social, educational theories (ELT, SLT and social learning theory) and adult learner principles is important to the design and framework of such a program, as this guides how students engage in their clinical learning towards gaining graduate-level practitioner skills. Clinical programs are best designed according to educational theories. Figure 8.2 provides a visual representation of the clinical program designed against the educational theories, which is also discussed according to the elements of best practice.

Figure 8.2

Clinical Program Designed According to the Educational Theories and Strategies



Note. EBP- evidence based practice.

8.3.1. Element 1: Scaffolded Longitudinal Clinical Program

The first element of best practice is a scaffolded, longitudinal clinical program that includes students' learning, clinical supervision and mentoring in the CLE. This scaffolding includes the type of clinical placement setting, the patient population at each particular placement and the level of clinical supervision of students.

The scaffolding begins with the design of the clinical placements within the clinical framework. The clinical setting predicates the patient population. This graduated experience across clinical placements allows students to gain their skills and competence according to the clinical setting and the type of patient that typically presents. Placing a student in a high-calibre environment—such as a hospital or VA facility—from their initiation in hands-on patient care may lead to a less than ideal situation for all parties, including the patient. However, a retrograde move from these complex healthcare setting to the less intense and complex can be somewhat counterproductive to the students' learning and engagement.

Another element of scaffolding is supervision and mentoring. A student who receives the same high level of supervision from their initiation into the clinics until completing the program does not appropriately develop the independence, critical thinking, decision-making skills and reflection necessary for a practitioner. The clinical supervisory model requires scaffolding depending upon the clinical setting and how junior or senior the student is. A supervisory model that does not adapt to the student's level of experience and attained competence will not appropriately develop their clinical and professional skills. This will also reduce students' dependence upon their CE and mentors. Dent's (2005) supervisory models in ambulatory care are helpful to illustrate and guide clinical leaders and educators on how to graduate and scaffold their approach.

8.3.2. Element 2: Varied Clinical Placements and Case Mix

The clinical settings and placement types are imperative to the students' development of clinical and professional practice skills and their graduate preparedness. From this single exemplar, successful clinical curricula include a program with varied clinical placement settings. In addition to being diverse, the CLE need to be authentic and as close to real-life expectations as possible to prepare students with the necessary clinical practice skills. This should include aspects related to the clinic's operations and governance, patient case mix and demographics, and CE support and supervision.

The clinical setting and the attending patient population that most resemble an authentic chiropractic practice profile will help prepare students. Programs should compare and evaluate the patient case mix across the clinical placements they offer, against their respective region's professional practice patient profile. Access to specialty populations, such as pregnant and paediatric patients, appears to be limited in the students' experiential learning. Managing these patient populations within the chiropractic practitioner's scope—thereby including more experiential learning, either through clinical placement or simulated exercises—may assist in their knowledge, competence and confidence in treating these patient populations.

The students' potential future clinical practice can include various settings, from private practice, community, government-based (VA, DOD) and hospital facilities. Employment arrangements can include an independent practice as a solo practitioner or a semidependent arrangement as an independent contractor or associate employee. Profession-based relationships may consist of functioning in a uniprofessional, multiprofessional or interprofessional arrangement. Students' experience across these diverse clinical placement settings and the professional interrelations within the clinical profile are important to prepare them for their future practice profile. Despite there being fewer opportunities available to

graduates in the government, hospital and community setting, this does not mean that this is not beneficial to the student experience. However, the inclusion of the private practice setting as a clinical placement should be a component of a students' experiential learning—they can learn the expected clinical, administrative, professional and business aspects of their profession. The clinical placements should best reflect the standards and profiles of the professional practice setting.

8.3.3. Element 3: Supervision and Mentoring from Multiple Clinical Educators

Students having access to multiple CE is as important as access to multiple clinical placement settings. Students value experience with a diversity of CE who provide a variety of perspectives, highlighting the situated and social learning opportunities in health-professional education. This enhances their development of learning about their CoP, professional identity and challenge their critical and clinical thinking. This also limits the potential of an apprentice-style model, where students learn, model and develop their professional identity according to the perspective of one CE. While the multiple educator to multiple student model invites variation and inconsistency, the benefits outweigh the costs of this arrangement.

8.3.4. Element 4: Education of the Clinical Educator

The integral role of the CE and their skills in supervision and mentoring are influential to the clinical program and the student and patient experiences. CE development in teaching strategies, adult learner principles and alignment with the curricula are critical elements. CE require skills in areas such as effective feedback strategies, student mentoring and reflection, appraising research, EBP and education-based theories to best provide learning strategies for adult learners. Another main objective in CE training is to provide consistency among CE, between CE and teaching faculty, and in the curricula. Efforts should

be made to connect the clinical faculty to the curricula through access to student resources, for example, the production and sharing of resources from the curricula that are relevant to the CLE. This would include clinical policies, updated manuals on clinical assessment, clinical management resources and guidelines for students and clinical faculty.

Ideally, CE should have a broader profile than their practitioner skillset and a professional profile beyond being a new graduate. The ideal CE profile would include a skillset in teaching, knowledge of research information literacy and utilisation within an EBP approach to patient care, IPE and IPP experiences, and the ability to incorporate business skills in experiential learning. Those with a profile consisting of only clinical practice experience should be provided support for internal or external professional development and continuing education to develop the skills needed for this role.

8.3.5. Element 5: Curricula Designed Around Industry Standards and Desired Graduate Attributes and Capabilities

The clinical program designed around graduate attributes, professional competencies and industry standards is necessary to ensure that students are acquiring the clinical and professional practice skills for what is required to meet the demands of the profession and the needs of future clinical practice.

Across these factors, program advisory committees (or similar groups) should be used on an ongoing and frequent basis to ensure the program, the profession and industry standards are aligned. Program developers and designers should include these needs in a reciprocal manner between the regular and the clinical curricula to complement each other.

8.3.6. Element 6: Evidence-Based Practice Approach in Curricula and Clinical Context

EBP is a foundational element of healthcare professional education (Lehane et al., 2019). Embedding EBP within both curricula and clinical training are necessary to ensure this

becomes a part of students' everyday clinical practice. The chiropractic curricula and clinical program should provide students with the necessary skills in EBP; this includes assessing students on the implementation of these skills in the care of patients. This includes five steps:

1. asking a clinical question;
2. searching the literature for the best available evidence to answer the question;
3. appraising the evidence for validity and applicability to the clinical case being presented;
4. using the critical appraisal along with clinical expertise and the patient's needs and circumstances to apply the integration to the case; and
5. evaluating the effectiveness of the clinical decision and exploring methods of improvement (Shreeve, 2012).

While this is important for students, CE need to be equally, if not more, skilled in these approaches and practices. When they are not skilled, they need to be educated in these skills to approximate the program curricula with clinical education. Having a consistent expectation of EBP across the CE and the clinical settings is ideal. As EBP is an industry expectation, expecting this skill in the clinical program should be implemented. Important though is recognising and implementing all elements of EBP, not limiting to the utilisation of research only in clinical decision making and patient care.

8.3.7. Element 7: Business Skills, Knowledge and Practices Aligned with the Professional Context

From this study, the business curricula were not adequately preparing students with the skills needed for the professional context, a point that has been made by other chiropractic scholars (Ciolfi et al., 2020; Ciolfi & Kasen, 2017; Gleberzon, 2012; Henson, et al., 2008). Provision of business building strategies and mentoring in the clinical environment through

social, situated and experiential learning may be far more beneficial than just a mostly didactic delivery.

The student and CE initiatives from this study, including further teaching and experiential learning about business practices in the clinical setting from experienced clinicians, may provide more relevant and applied learning. Shadowing clinical administrators or performing some administrative tasks on a rotational basis, could provide experiential learning in business tasks similar to those conducted in the private practice setting. An alternative is to replace this content within the curricula with content from an external organisation that has a focus on business for HPE or from the professional associations; in such an arrangement, students would obtain recognised learning and credit. When competencies include independence of practice, the clinical curricula and experiential learning should include clinical, professional, business and entrepreneurial skills necessary for the chiropractic practitioner. Chiropractors' typically practice as solo practitioners (sole proprietorship), associates or within partnership arrangements (Ciolfi & Kasen, 2017). The elements that have been identified previously as necessary components to chiropractic practice include strategic management, marketing, accounting, organisational behaviour and human resources, operations and systems management, legal and ethical issues, managerial decisions and finance (Ciolfi et al., 2020; Ciolfi & Kasen, 2017; Henson et al., 2008;), as discussed in detail in the discussion chapter.

The business curricula offered in this institution may be considered along several potential streams for delivery in the chiropractic program:

1. Option 1: content delivered within the chiropractic program; didactic delivery that includes experiential-learning activities that are within the service-learning experiences.

2. Option 2: similar to option 1, but with engagements in the profession. This could be inclusive of the clinical placement/remote internships that are more invested in learning and modelling business practice skills in place of a clinical/patient internship. This would need to be a selective placement in successful, growing practices for students to model and learn from, ideally in the final component of the clinical program.
3. Option 3: students have either mandatory or optional professional development requirements included in their clinical requirements. These would include experiential-learning activities or credits applied for continuing professional development provided by the profession. Students may obtain credit from attending external profession-based seminars.
4. Option 4: students can elect a stream that would more specifically include the development of skills and competencies for sole proprietors/partnerships in business as a new graduate. This could be provided as a specifically designed elective or part of the curricula stream within the program; this approach would be similar to the nutrition degree offered at this institution of study, where students can be dually enrolled. For those institutions that include other health-related programs, then this may be an opportunity for interdisciplinary learning.

Henson and colleagues (2008) state that a necessary and valid alternative in the delivery of practice management training for chiropractors outside the chiropractic institution or the profession. Proposals along this line, similar to option 4, include providing students with the option of a ‘double degree’ or a ‘dual degree’ program that includes business or even an MBA program that is specific to small business health practitioners. The business could be offered externally at another tertiary institution that offers business courses, programs or business administration programs.

Previous authors have considered that the chiropractic business curricula at a minimum should include (a) organisational behaviour and human resources, (b) strategic management, (c) finance, (d) marketing, (e) legal and ethical issues, (f) accounting, (g) managerial decision-making and (h) operations and systems management (Ciolfi et al., 2020). It is the opinion of this author that these topics also be recommended as components of the chiropractic clinical and business curricula based on the findings of this study.

8.3.8. Element 8: Interprofessional Education, Interprofessional Learning and Interprofessional Practice Opportunities

From this thesis, there was an acknowledgement that a students' interprofessional engagements could be highly influential to their IPL and future IPP, that is, knowing their professional scope and how to work within a patient-centred paradigm for care. The value of IPE in the pre-qualification learning stages include students gaining an understanding about the roles of different health care professionals in relation to a particular clinical area and enhancing the quality of care delivered to patients (Reeves, 2016).

Professional socialisation and coordination seem an imperative component to future IPP. It was apparent that the proximity to other professions does not lead to formalised or coordinated interprofessional engagements. Therefore, the recommendation of formalised interprofessional engagements with strategies for socialisation among students and educators is essential for developing into practice. Strategies could include commencing with shared teaching in the regular curriculum across commonly delivered subjects with other health disciplines, expanding into problem-based clinical simulations in the theoretical learning space and culminating in experiential and situated learning in the clinical settings. Students engaged in these experiences before their clinical initiation may develop an expectation and acquired behaviours before IPP in real patient care. While IPL, IPP and person-centred care

are the objectives, trying to achieve this in the absence of the social constructs may lead to fewer opportunities and professional boundaries and barriers.

In the institutional clinical settings, working within their governance and policies, formalised IPL and IPP can take the form of observations, simulated exercises or a team approach to patient care. The latter option requires sincere planning by the various discipline leaders to develop a meaningful framework with stakeholder buy-in, and adoption across the disciplines and CE, students and patients. For the hospital, VA and community health settings, formalised interprofessional socialisation and coordination are also needed to establish better experiential IPL. While this would ideally be related to the care of patients, it could also include journal clubs, research projects and other types of interprofessional engagements that are part of the allied health and medicine profiles in these settings. This may mean changes to the practitioner/CE roles and behaviours to adapt to the settings' interprofessional climate and hierarchy.

Outside the CLE, professional development activities can include observations or interviewing other health practitioners as to how their discipline may manage a clinical patient presentation that is common to chiropractic. Attending seminars and conferences that are not specific to chiropractic may also encourage learning and socialisation for the student. All these options of IPL may further develop students' understanding of their roles and the roles of others in providing patient care.

From this study, the approaches and recommendations of D'eon (2005) would be appropriate to those interprofessional approaches needed in chiropractic clinical curricula:

- Students need to be challenged with progressively more complex tasks that reflect the reality in which they will be working.
- The learning situation needs to be structured using the five elements of best-practice cooperative learning: positive interdependence, face-to-face promotive

interaction, individual accountability, interpersonal and small-group skills, and group processing.

The learning process needs to be approached from an experiential-learning framework cycling of planning, doing, observing and reflecting (D'eon, 2005).

8.4. Strengths of the Study

This study's strengths are related to the rigour applied through the study design and methods of data collection. Three stakeholder groups participated, with the researcher being in situ to experience the phenomena of the clinical education at the institution. Active participation during the focus groups and one-on-one interviews allowed for further facilitation and 'piggybacking' of ideas and pertinent points. The researcher could see that strong themes and categories developed within the groups, and between the groups and individual participants. In particular, there was a richness of the data collected through the spontaneous interactions and discussions among the participants in the focus groups; the sessions became very engaging and animated, with students exploring some of the general and sensitive questions.

On the completion of their focus group and interview session, several of the student and new graduate participants reported to the researcher their positive experience of participating. They described this as a cathartic and therapeutic exercise, which encouraged them to express their ideas and perceptions. This added to the richness and depth of the data.

8.5. Limitations of the Study

Attempts have been made to address some of the limitations associated with generalistic qualitative approaches through the confirmability, dependability and triangulation applied to the study methods and design. This study included the general limitations of qualitative research, such as difficulty in maintaining objectivity and bias

(Shah, 2019), and inability to generalise the findings to wider populations with the same degree of certainty in comparison to a quantitative study (Atieno, 2009). There were several more specific identifiable and limitations of the study, which included the following.

8.5.1. Location

The study's scale, sample size and use of a single study site may not represent the perceptions of similar target groups from other institutions. A study that includes multiple institutions or multiple case studies, either as a comparison or an aggregate of the data, may provide more generalisability and transferability. Findings may have been different not only if the data were collected from another institution in the US, but also in different countries. Some countries/regions have different regulations or requirements for education and clinical practices.

No two clinical settings are identical, creating some diversity among participants' experiences and perceptions. Several participants were from the lower trimester (trimester 8), which may have limited some in their responses. They have not yet experienced certain aspects of the clinical program, such as the full cohort of spoke rotations. Not every participant had access to an identical clinical rotation, so variability was inevitable among the clinical faculty member, student and new graduate participants.

8.5.2. Recruitment of Participants

There were some limitations to Phase 4 of the study, as the new graduate population were challenging to recruit. For this reason, the resting of recruitment and sampling was necessary, and recruitment was re-established two years later. The snowball sampling utilised for this stakeholder group has limitations that include non-random selection procedures,

reliance on informants' subjective judgements, confidentiality concerns (Johnson, 2014) and potential biases (Marcus et al., 2016).

Another limitation of recruitment includes sample bias that only those who were willing to participate may have had a biased view, possibly more positive than the rest of the sample population. As well, there were other items that could have influenced the participant recruitment and sampling, thus limit, the study findings. For example, the new graduate interviewee may have felt confident in their ability to practice, however, may not have the actual skills. Contrarily, they do not feel they have the confidence but have adequate knowledge and skills. This may have influenced new graduates' willingness to participate as well as some of their responses to the interview questions.

8.5.3. Data Collection

Part of this study's original design was to conduct document review, including accreditation evaluation reports—to examine how the clinical program may have been viewed and appraised by another external and critical stakeholder—and the institutions' self-evaluation reports. However, these reports were not forthcoming after several written and verbal requests to the institution and the accrediting body. As such, these reports were not able to be included in the document review. In place of the accreditation reports, the institution places publicly available annual reports on their website. These have been reviewed for the document analysis as another way to triangulate the data.

8.5.4. Analytical Strategy

The study used thematic analysis to analyse the data. Thematic analysis can provide a rich, detailed and complex account of data (Braun & Clarke, 2006). Thematic analysis is flexible, but is criticised for this reason for inconsistencies and lack of coherence for

developing themes from the data (Holloway & Todres, 2003; Nowell et al., 2017). As a method of data collection, focus groups have some weaknesses that include nominal group process (Leung & Savithiri, 2009). However, the researcher/interviewer attempted to manage and minimise this by ensuring the outspoken individuals did not dominate the sessions or limit others' attempt to contribute.

8.5.5. Other Limitations

This study design was also a snapshot in time from all the participants, not a longitudinal study of the participants that may provide further insight. A further limitation of the study related to stakeholder populations. The patient's voice was missing from this study; their perceptions and experiences may have added another angle and layer to the study through the process of interviews, focus groups or a satisfaction survey.

The employer/chiropractic principal practitioner of the program's graduates could also provide their perceptions of the graduates of the chiropractic program. This stakeholder group was considered difficult to recruit and collect data; hence, it was not further pursued as a participant cohort sample.

This is not relevant to the study objectives and research questions.

The pandemic occurred after the data collection phase and during the writing phase, this would require commencing data collection again from the institution. This is a worthy study, but not required for this particular study

The study was conducted before the Covid-19 pandemic occurred. During the pandemic chiropractic clinical education, like most health student education, was impacted by reductions in face-to-face learning opportunities and restrictions on clinical placements. However, this is a once in a lifetime phenomenon and to model the impact of the pandemic

would require the implementation of a lengthy longitudinal design. This was not my research objective and is outside the scope of the present study.

As discussed in Chapter 3, the researcher has their own personal biography and influenced by their own gender and culture (Denzin & Lincoln, 2011). Inevitably, the researcher will approach the study with their own set of ideas, theory or framework ('ontology') (Denzin & Lincoln, 2000). The choice of the selection of themes and reporting of the data from the researcher's viewpoint and cognitive bias must be mentioned as a limitation despite all strategies to address research rigour, credibility, dependability, confirmability and transferability, as well as triangulation of the data.

Furthermore, some of the responses from the participant cohorts may have been biased by the chiropractic program's marketing strategies and other messaging from the institution's leaders. Therefore, an awareness and consideration of an institution's underpinning culture and philosophical perspective must be applied.

Finally, the perceived level of confidence of the participants was not measured for new graduates or others by measurement or survey tool, such as Hecimovich and Volet's Patient Communication Confidence Scale (PCCS) and Clinical Skills Confidence Scale (CSCS) (2012), or the Canadian Medical Education Directives for Specialists (CanMEDS) competencies framework (Frank, 2005). Through collecting participants' perceptions and opinions through this study and not taking direct measurements, this is a noted limitation of this thesis.

8.6. Future Research

Future studies using the same model will confirm or refute the findings from this study and will add to the growing body of literature in this field. Future projects might include additional stakeholders to explore the perspectives of the graduate's employer and the

patient. A larger study might use an online survey or a mixed methods investigation to collect data from stakeholders who do not have time or prefer not to be interviewed. Such a study ought to be inclusive of multiple programs from similar or cross-continental accredited institutions (Europe, North America, Australasia, Africa).

8.7. Conclusion

The findings from this study are envisaged to assist other chiropractic programs to formulate an innovative curriculum that promotes a model of best practice clinical education. This study can inform accrediting bodies and national boards within the international and Australian context and the candidate's colleagues, through previous and future conference presentations and publications.

Furthermore, a clinical program designed around adult learner principles and industry and professional standards that provides profession-based engagement throughout the program is optimum. Clinical programs that demonstratively apply situated learning principles, social learning and experiential learning are the most effective.

In conclusion, there were eight elements of best practice and recommendations that emerged across the three stakeholder groups from this exemplar chiropractic program. These are represented in Figure 8.1 and have been discussed in context in this chapter. They are (a) a scaffolded longitudinal clinical program, (b) varied clinical placements and case mix, (c) supervision and mentoring from multiple CE, (d) education of the CE, (e) curricula designed around industry standards and desired graduate attributes and capabilities, (f) EBP approach in curricula and clinical context, (g) business skills, knowledge and practices aligned with the professional context and (h) IPE, IPL and IPP opportunities.

In closing, despite chiropractics' 125 years as a profession, very few studies have examined chiropractic students' clinical education, with chiropractic academics observing a

need for research in this area. This study has made a significant contribution to scholarly discourse, yet there remains many gaps in our knowledge of the education outcomes of chiropractic clinical education programs in the USA and elsewhere.

Appendices

Appendix A1. Review of Literature Data

Table A.1

Table of Data Extracted from Studies Included in the Review (N = 42)

Author	Study aims	Study design	Setting; sample	Relevant key findings
Amorin-Woods et al. (2019)	To explore the perceptions of students engaged in rural clinical placement compared to their campus clinic; future practice expectations	Mixed methods design	Australia; Murdoch University students engaged in non-metropolitan clinical placement	Overall, students had positive perceptions of the clinical placement. Affected their empathy, professional and clinical skills. Students were more likely to choose rural options of professional practice.
Boysen et al. (2016)	To explore students' sense of confidence from engagements in short-term overseas SL experiences	Qualitative exploratory study (focus groups)	USA; sample of students from overseas clinical placement	Students interviewed on college campus four weeks after return. Students found the SL experience positively affected their confidence in clinical and professional skills. SL provided a more real-world setting for them to develop the necessary skills for practice.
Brett et al. (2013)	To review accreditation standards of public health and IPE in CAM disciplines	Report	USA; chiropractic and other CAM programs	The paper reviews the accreditation standards in public health and IPE for chiropractic, naturopathic medicine, acupuncture and oriental medicine, and

Author	Study aims	Study design	Setting; sample	Relevant key findings
Chung et al. (2009)	To discuss the model of IP educational model and initiatives in their program	Commentary	Canada; CMCC students and program	<p>massage therapy. The clinical placement of chiropractic students in VA settings answered the IPE aspect of accreditation standards.</p> <p>The student-driven IP task force developed IP exchanges with medicine at the University of Toronto. The paper outlines the program and the benefits of this exchange for students from medicine and chiropractic.</p>
Dunn (2006)	<p>1. To compare and evaluate the graduate profile and careers of students who engaged in DOD chiropractic internship to those who engaged in regular internship.</p> <p>2. To review the demographics, professional activities, income and satisfaction</p>	Survey	xxxx, USA; students and graduates who engaged in internships	<p>The paper provides background to the integration of chiropractic in DOD medical facilities and initiation with xxxx. No significant differences for those who went through the DOD internship compared to regular internship programs. None of the participants were engaged in DOD or Veterans Affairs medical facility or hospital setting. There were minimal differences in salary and similarities in career satisfaction. There was no evidence to support the idea that this clinical training truly</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Dunn (2007)	To understand the state of chiropractic academic affiliations within the Veterans Affairs	Survey	xxxx, USA; chiropractic programs	<p>broadens graduates' scope of practice or employment possibilities.</p> <p>The paper describes the integration of chiropractic into the DOD hospitals and the commencement of student internships with xxxx. It also describes how the program has expanded, and the clinical experiences offered to students in these settings. At the time of publication, three academics had affiliations with four VA clinical settings. The paper itemises the chiropractic academic affiliations with VA medical facilities and details of the rotations and describes the differences between the student experience in the facility. It also highlights the interprofessional opportunities and numerous strengths for chiropractic interns in these settings. Despite the strengths, the four existing chiropractic academic affiliations were largely dissimilar in design and operation.</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Dunn et al. (2009)	To compare chiropractic integration within the healthcare systems of the U.S. Department of Defense and U.S. Department of Veterans Affairs	Literature review	USA; chiropractic professions and programs	The paper identified practices and policies that may either support or challenge the extent of chiropractic integration within mainstream healthcare environments (Veterans Affairs, DOD) and opportunities and threats to chiropractic integration. A SWOT analysis was conducted to examine the current state and future direction of chiropractic service integration within these integrated healthcare systems. The SWOT analysis examined nine areas: legislative history, programmatic growth, leadership structure, employment status of providers, clinical work duties, patient access, patient demographics, academic affiliations and research. Background information was provided on chiropractic academic affiliations with xxxx.
Ebrall (2007)	To present the problems with accreditation standards and requirements	Commentary	Australia; chiropractic education/educators	The paper summarised the status and provided a critique of the local CCEA accrediting body for Australasian

Author	Study aims	Study design	Setting; sample	Relevant key findings
	related to clinical programs			chiropractic programs. It explored the issues of set competencies and capabilities and proposed changes. The author suggests that standards out of touch with contemporary teaching practice and professional requirements.
Ebrall (2009)	To propose that chiropractic is at a crossroads	Commentary	Australia; chiropractic profession	The paper provides a different viewpoint—that the chiropractic profession is at a crossroads. The author argues for a chiropractic identity that includes and accepts two types of the profession. The paper highlights key features of Australian government-funded, university-based chiropractic education, implementation of best practices in teaching, and aspects of research, accreditation and registration in Australia.
Ebrall (2018)	To present a research proposal for a hackathon to change and advance chiropractic education	Commentary	Worldwide; chiropractic programs/education	The author suggests that chiropractic education is in ‘stasis’—requiring review and revision—and is critical of accreditation that prevents innovations and advances in

Author	Study aims	Study design	Setting; sample	Relevant key findings
Ebrall, Draper,	To introduce two current research projects at RMIT	Commentary	Australia; students and CE of RMIT	<p>curricula. The author argues using the analogy of chiropractic education being a frog at the bottom of a well—comfortable in this limited world with colleagues and is incapable of imagining change. They recommend brainstorming chiropractic education through a hackathon. A hackathon is a way of reimagining a problem by persons remote from the problem, and could be used to progress chiropractic education to a point where it is moving faster, stronger and more connected than now. Challenges to consider in the hackathon are (a) accreditation, (b) the program models and length of chiropractic programs, (c) academic productivity where there are few publications from academics, (d) knowledge explosion, (e) learning styles, (f) learner assessment, (g) ‘anywhere, anytime’ flexible learning.</p> <p>The paper introducing and justifies the two learning and teaching</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Repka (2008)	chiropractic program		chiropractic clinical program	research projects to address issues within the clinical program. The author postulates that there is dissonance and disconnect between the curriculum and the clinical program.
Ebrall et al. (2009)	To develop best practices in chiropractic education with advice from academic leaders, industry leaders and practitioners	Narrative report	Australasia; chiropractic leaders attending a chiropractic education summit	The main outcome of the summit was the development of four themes, but no statements on best practices—assessing students in the clinical setting; engaging students in learning research and scholarship; the teaching of clinical skills and chiropractic technique; and aligning taught content with industry (professional) practice—were forthcoming. The paper presents a solid foundation of educational concepts.
Gliedt et al. (2015)	To explore student perception of the future role and identity of chiropractic	Cross-sectional survey	North America; 1247 students from 12 North American chiropractic colleges	Students held contradictory perceptions of their future role. They preferred EBP teaching in programs and desired mainstream standing for the profession. Students held onto the historical and traditional ideals of the subluxation complex and the role of the practitioner in

Author	Study aims	Study design	Setting; sample	Relevant key findings
Hammerich et al. (2019)	To assess the attitudes of chiropractic students to patient-centred care	Cross-sectional survey 1858 students across seven programs	Worldwide; students from seven international chiropractic programs	treating this, but more research is required into the effects of the adjustment. The authors suggest the contradictory responses indicate cognitive dissonance. Chiropractic students tend towards patient-centred care. Scores were slightly lower than medical students. Gender, age and some cultural differences accounted for the results.
Haworth et al. (2020)	To explore final-year students' self-perceptions of readiness for transition to practice, professional identity and experiences of interprofessional clinical practice	Qualitative exploratory study (semi-structured interviews)	Australia; 28 chiropractic and osteopathic students from four programs/universities	Most students felt prepared. All clinical experiences (consultations with patients) prepared them to transition to practice, but clinical settings other than the UHC offered superior preparation. Merit of a scaffolded program. Students commence in UHCs with reasonably healthy patients, which allows them to build up their skills. They then transition to community clinics or private practices after gaining skills. Community and private practice settings prepare them better for their transition to practice because they observe more-diverse patients and complex

Author	Study aims	Study design	Setting; sample	Relevant key findings
				<p>presentations.</p> <p>Students have more autonomy in community and private practice settings.</p> <p>Educational experiences that develop their professional identity and interprofessional X are limited, despite being in university.</p> <p>IPL activities were ad hoc and opportunistic, and students lacked a clear understanding of the behaviours that demonstrate their professionalism.</p>
Holt and Beck (2005)	To report the basic characteristics of new chiropractic patients presenting to the New Zealand College of Chiropractic teaching clinic	Retrospective analysis	New Zealand; 1004 patients who attended the college's teaching clinic	<p>Patients presenting to the New Zealand College of Chiropractic teaching clinic showed many similarities with similar studies in USA and Australia.</p> <p>Some discrepancies were noted, however, between the patient characteristics at the teaching clinic and the general New Zealand population.</p>
Humphreys and Peterson (2016)	To describe the chiropractic program that has been integrated with the medicine discipline the university setting	Commentary	Switzerland; Master of Chiropractic Medicine program at the University of Zurich	<p>Students, faculty and the profession benefit from the curricula and clinical chiropractic program being fully integrated with medicine. Students have a profound clinical program across all six years, with early</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Innes et al. (2016)	<p>1. To investigate the similarities and differences between the councils of chiropractic education in their definitions of graduate competence and educational competencies.</p> <p>2. To make recommendations for significant variations to address deficiencies</p>	Systematic review and comparative analysis	Councils on Chiropractic Education (Australia, Europe, USA and Canada)	<p>experiential learning in hospitals and private practice, and patient rights and privileges in the hospital and outpatient clinic in their final year. Benefits were evident for the educational and professional profile.</p> <p>The paper describes the spiral curriculum shared with medicine within the university setting, and discusses its advantages, opportunities and challenges for integrated education and both clinical and hospital placements.</p> <p>Differences exist between the councils and jurisdictions in the standards, due to varying definitions of competence. This has resulted in dissimilarities in practitioner profiles across regions and colleges. Variations in definitions and the prescriptive lists for describing competency may result in differing practitioner profiles. The definitions of competence for all councils were similar and included the elements of ‘knowledge’, ‘skills’</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Kadar et al. (2015)	To examine perceptions of IPE and IPP within a CAM institution	Survey	USA; 321 students, faculty and alumni of chiropractic and acupuncture and oriental medicine at Southern California University of Health Sciences	<p>and ‘attitudes’. Only one council included the expected ‘abilities’ element. Some variations were observed in the domains and prescriptiveness for graduate entry–level standards. Far more differences were seen with the number of domains, but a high degree of content similarity with the domains between the councils. Councils had used differing levels of prescriptiveness in the domains. Differences were seen in radiography. The authors recommend uniformity in standards between councils.</p> <p>The majority expressed positive perceptions of IPE and IPP. However, many reported a lack of understanding of the distinct roles of select healthcare professions. The study also suggested that the campus community is not homogenous in its understanding of CAM or allopathic professions, nor is it homogenous in its understanding of IPE and IPP. While the</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Kaeser et al. (2014)	Study of case mix and patient demographic at teaching clinic compared to the professional benchmark	Quantitative analysis using descriptive statistics. Data obtained from EHR and compared to the professional benchmark <i>Practice Analysis of Chiropractic</i> (2010)	USA; patients attending teaching clinics	<p>overall positive attitudes towards IPE and IPP imply a willingness to improve collaboration between these groups, the lack of understanding of profession-specific roles must be addressed to support effective implementation of IPE.</p> <p>Teaching clinic patients are representative of those seen in practice. New patient demographics and chief complaints at the chiropractic institution's fee-for-service clinics were compared to the patient population of practising chiropractors in the USA. Furthermore, the common comorbidities of these patients were compared against reference standards for the adult population. Demographics appear to be dissimilar to those of USA practising chiropractors for several important demographics, characteristics and types of complaints; in addition, lower</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Kaeser et al. (2016)	<p>1. To describe the demographics and clinical characteristics of a sample of chiropractic patients at a free, community-based clinic</p> <p>2. To assess clinical and educational opportunities for students to work with diverse populations, collaborate with other professions and practice health promotion through patient education</p>	Cross-sectional survey	USA; patients who attended chiropractic community teaching clinics of the Logan College of Chiropractic	<p>levels of comorbidities were reported.</p> <p>Patients' health status and health risks were collected from patients and their interns. Students had experiences with diverse patient populations. Patients who request have more complex care needs and multiple comorbidities.</p> <p>Patients reported mental health issues, but there were no other health professions within the setting.</p> <p>Interprofessional opportunities were lacking despite there being a patient need. This clinical setting provides students with opportunities to work with a diverse patient population and co-manage complex care needs through interprofessional collaboration.</p>
Karim (2011)	To discuss the need to change educational frameworks in chiropractic for interprofessional healthcare reform	Commentary	USA; chiropractic program and profession	This paper explores the research to argue for necessary educational framework changes to improve chiropractic interprofessional healthcare culture and competence.
Karim and Ross (2008)	To examine IPE and chiropractic	Commentary	Canada; chiropractic profession	The paper highlights deficiencies in chiropractic education

Author	Study aims	Study design	Setting; sample	Relevant key findings
Kopansky-Giles et al. (2007)	To introduce the clinical program and the CLE offered at CMCC	Commentary	Toronto, Canada; CMCC clinical program	and the practice of IPE, which justify moving from a siloed profession and practice to a culture of IPE and IPP. There is a need for IPE in chiropractic undergraduate programs. The paper describes the CLEs of a Canadian chiropractic clinical program, and discusses how community and hospital settings provide a highly varied clinical setting in the patient population they serve, real-world clinical engagement for students, and an integrative and collaborative setting. The program provides a progressive and contemporary clinical experience for students and faculty, and describes the patient population and IPP. The reasons, purpose and benefits for chiropractic clinical education in community and hospital settings are discussed.
LeFebvre et al. (2011)	To explore the process for development of the EBP competencies	Research in action	USA; chiropractic academics of the EBP curricular committee of the University Western States	The authors describe the processes to develop the EBP competencies that drive the curriculum. Six standards and 31

Author	Study aims	Study design	Setting; sample	Relevant key findings
				learning objectives were generated. These were used as a blueprint to strengthen EBP teaching and learning within the curriculum, and were made available to other institutions as seed documents. The paper highlights the importance of developing EBP competencies to implement across the curriculum and the clinic, not just in aspects of certain units.
Lishchyna and Mior (2012)	To describe and compare the clinical case mix of a recently opened, community-based, chiropractic teaching clinic in Toronto with previously published practice data	Retrospective, descriptive, cross-sectional study	Canada; files of 580 patients who attended the CMCC community clinic	The demographics and clinical characteristics of new patients presenting to the Bronte (community) clinic were similar to practice data for private practice chiropractors in Ontario, Canada. Students did not have much exposure to a paediatric population. <i>The case mix of this teaching clinic provides interns with appropriate learning opportunities to achieve entry to practice competencies.</i>
Morgan and Morgan (2006)	1. To discuss and critique the balance of didactic versus experiential	Commentary	USA; X	The authors discuss ways to create a more diverse clinical experience and more

Author	Study aims	Study design	Setting; sample	Relevant key findings
	education in delivery of chiropractic education 2. To recommend ways to improve and enhance the balance between didactic and experiential learning by increasing empirical learning			interactive learning processes for chiropractic students. They argue that change is needed to expand chiropractic clinical experience and rotations to multidisciplinary healthcare facilities, which would provide students with diverse patient populations from which to enhance their experiential learning.
Morschhauser et al. (2003)	To determine the case mix and patient demographics of college clinics and identify any variation according to the clinical site	Survey PBRN	USA; 1612 patients attending any chiropractic teaching clinic of four chiropractic colleges	Data collected included the nature, location and duration of the chief complaint, patient age, sex, race. Eight clinics were outreach clinics, one was inner city, two were main clinics and three were satellite clinics. Variable patient demographics were seen across the different clinic types. Different clinics facilitate the students' exposure to different patient demographics and a richer case mix. More younger patients were seen at the on-campus clinic, while outreach clinics saw more acute presentations. Comparison with private practice showed that the demographics for

Author	Study aims	Study design	Setting; sample	Relevant key findings
Mrozek et al. (2006)	To review the research in chiropractic education and to provide recommendations for the future direction of research	Review of the medical and chiropractic educational literature	Worldwide; literature on chiropractic educational research	<p>patient race and chief complaints were similar to those of satellite clinics. Operating several types of clinics will increase patient variability. The variability in patient case mix increases diversity in students' clinical exposures.</p> <p>The review highlighted the lack of research and progress. Existing research tended to focus on instruction, curriculum, assessment and faculty development, with more research needed on patient-centredness and continuing education. The authors argue that there is a need for more research and collaborations to improve output, particularly research relating to program delivery and curriculum. They call for an increased focus on scholarship and support to grow the field of chiropractic education research.</p>
Murphy et al. (2008)	To provide a perspective on the state of chiropractic and how to progress the profession	Commentary	USA; chiropractic profession and education	The paper draws comparisons between chiropractic and podiatry, and makes recommendations for improvements, using podiatry as a

Author	Study aims	Study design	Setting; sample	Relevant key findings
				benchmark. Areas for improvements include public health, education, identity and professionalism. They have become more mainstream, and the image of the chiropractic profession needs to change.
Myburgh et al. (2008)	To describe the development and integration of chiropractic with the Danish health system and with medicine in a university setting	Commentary	Denmark; profession and program of the University of Southern Denmark	The paper provides a synopsis of the secondary legitimacy of chiropractic using a contextualised example.
Myburgh and Mouton (2008)	To explore the development of the Danish chiropractic program at the University of Southern Denmark, and how this has influenced the profession and professional legitimacy	Qualitative exploratory study	Denmark; stakeholders at the University of Southern Denmark	The authors discuss the history of the program development, with input from multiple stakeholders. The program is integrated with medicine, with shared teaching. The authors emphasise the importance of placement and the standing of the chiropractic program within the university and hospital placement for experiential learning. This makes them part of an integrated healthcare team. The factors of secondary legitimacy with IPE, university placement and hospital clinical placements are highlighted, and the

Author	Study aims	Study design	Setting; sample	Relevant key findings
Puhl et al. (2017)	To describe the case mix experienced by chiropractic students during their clinical internship at CMCC and to compare the case mix with published data for practising chiropractors	Prospective observational study	Canada; 828 patients who attended teaching clinics at CMCC	<p>advantages and disadvantages of being in the university system are discussed. From the 24 participating interns, 828 patients and a total of 948 unique complaint presentations were included. Interns completed 46 internship sessions across CMCC student teaching clinics of college campus clinic, three community clinic (South Riverdale, Sherbourne and Bronte) and two hospital placements (St. Mike's Hospital and St. John's Rehabilitation Hospital). Patients presenting to CMCC teaching clinics were similar to those reported in professional practice data. Interns encountered multiple complex clinical cases and a diverse case mix but had few experiences with paediatric populations. All participating interns experienced case mixes that included complex cases. Data are important to assess the comprehensiveness of</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Pulkinnen and de la Ossa (2019)	To explore chiropractic graduates' perceived preparedness for practice in the seven key competencies of the Canadian Medical Education Directives for Specialists	Cross-sectional survey	Europe; 124 graduates of nine European chiropractic colleges: AECC, BCC, IFEC Paris, IFEC Toulouse, MCC, RCU, SDU, USW and UZ. Graduates of 2014, 2015, and 2016	learning opportunities provided to chiropractic students during their clinical internships. There were differences in students' preparedness for practice between colleges and across competencies and items. Graduates scored the lowest in collaborator (3.76) and scholar (3.78) competencies, and the highest in professional (4.39) and chiropractic expert (4.13) competencies. There was a lower level of perceived preparedness for the collaborator, scholar and manager competencies. There was some congruence of results between medicine and chiropractic. The study reported low response rates; therefore, the results remain inconclusive. The authors conclude there may be a gap between education and professional practice regarding perceived preparedness, and graduates perceived themselves to be unprepared in some

Author	Study aims	Study design	Setting; sample	Relevant key findings
Reggars (2011)	To debate the current status of chiropractic and explore the factors that influence the credibility, advancement and public utilisation of chiropractic in Australia	Debate	Australia; chiropractic profession	<p>competencies. Furthermore, the authors recommend that these preliminary results be used to improve the curricula of chiropractic education. There is a need for further studies to identify what causes this lack of perceived preparedness and the best strategies to train future chiropractors. The paper provides an outline of the history of chiropractic in Australia. Reggars notes that there have been some improvements in the profession, particularly in undergraduate education and generating a research culture. Yet, the persistence of historical features of the profession are hindering progress and the profession's standing. In the 1979s and 1980s, education was offered in universities, research improved, and there was increased utilisation of chiropractic by the public. In the 21st century, progression seems to be retrograde due to a 'fundamentalist'</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Riva et al. (2010)	To present the interprofessional initiatives at CMCC	Commentary	Canada; students and profession of the chiropractic program at CMCC	<p>faction's approach to vertebral subluxation. There is a necessary push for science to move the profession forward. The author details the complaints made to the registration board against chiropractors.</p> <p>Riva et al. recommend mandatory interprofessional shadowing experiences at chiropractic institutions to address the IPE requirements that the WHO added to its global health agenda. This is a necessary component of all health professionals' education. Chiropractic is behind other healthcare providers in implementing IPE. An example was provided of pharmacy and chiropractic students' IP experience through shadowing. The authors recommend the use of adult learner principles for the experience and not to be overly prescriptive. Furthermore, they recommend the SNAPPS model to allow the student to</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Shreeve (2012)	To discuss the implementation of EBP in chiropractic curriculum	Commentary	USA; chiropractic programs	become an active learner in their clinical encounters and learning objectives. Provided the SNAPPS model in clinical training will lead to future collaborative practice. There are few IPE opportunities at this single discipline private institution. Three articles were reviewed that described the use of EBP in chiropractic education. Articles included only steps 1–3 of EBP. There is a need to incorporate student assessment for the important next steps. Patient preferences and implementing evidence into patient management. The chiropractic curriculum needs to include all five steps of EBP and assess its use in academic and clinical environments. Students need to build their skillsets for practice.
Simpson (2012)	To explore the five eras of chiropractic, its interprofessional image and its factions	Commentary	Australia; chiropractic profession	This paper examines the history of the chiropractic profession, including the five eras since its origins in the 19th century. Concerns with the current status of the profession,

Author	Study aims	Study design	Setting; sample	Relevant key findings
Till and Till (2000)	To highlight the differences in chiropractic and medical clinical education/internship experiences from the perspective of chiropractic academics	Commentary	South Africa; chiropractic students	<p>which will prevent the progression of chiropractic into the 21st-century healthcare system are described. The author suggests that there are three options for the future of the profession: (a) maintaining the status quo, (b) uniting under an evidence-based scientific approach as partners in healthcare delivery and (c) dividing the profession into evidence-based and subluxation-based practitioners. Chiropractic needs to improve; being university-based has not made the desired changes, as it is still a marginalised profession.</p> <p>This paper reviews the differences between the chiropractic and medical internship experiences, in South African and international programs, with a particular focus on hospital placements. The authors identify deficiencies in chiropractic clinical programs in access to patients and adequately preparing</p>

Author	Study aims	Study design	Setting; sample	Relevant key findings
Todd et al. (2017)	To determine students' perception of preparedness following a rural clinical placement	Quantitative survey	New Zealand; undergraduate students of New Zealand Chiropractic College	students for professional practice. Students showed improvement in their perception of preparedness following a one-week placement in regard to paediatric patients. The placements also showed diversity in the patient case mix.
Walker (2016)	To introduce a 10-point plan for the progression of chiropractic education and profession	Commentary	Australia; chiropractic profession	Walker describes the historical and philosophical perspectives that are retarding the profession's progress and acceptance in broader health context. A 10-point plan for a new chiropractic is proposed to promote full acceptance of the profession. Elements relating to chiropractic education include improving the pre-professional education of chiropractors, establishing a progressive identity, being pro-public health, improving clinical practice, embracing EBP and supporting research. Adoption of such a plan will see chiropractic progress to full legitimacy and acceptance by other health providers,

Author	Study aims	Study design	Setting; sample	Relevant key findings
Wyatt et al. (2005)	To debate the key issues of the chiropractic profession and education towards improvements	Debate	North America; chiropractic academics	policy makers and the public. The authors propose eight positive changes for chiropractic program: evidence-based curriculum, active research culture, university integration, less tuition-dependent, mandatory postgraduate internships/residencies, hospital placements, interdisciplinary training and increased exposure to varied case mix and complex patients.

Note.

EBP- evidence based practice,

SNAPPS- Summarize history and findings, Narrow differentials, Analyze differentials, Probe preceptor about uncertainties, Plan management, Select case-related issues for self-study

IPE- interprofessional education

WHO- World Health Organisation

Table Appendix A.2

Data Extracted from Grey Literature Included in the Review (N = 14)

Author	Objective	Publication type	Setting	Relevant key findings
European Council on Chiropractic Education (2011)				From a review of the 11 available ECCE accreditation team reports, there were recurring themes within these critical appraisals. These included (a) being evidence-based, (b) IPE, IPL and IPP, (c) patient case mix, (d) CLE/types of clinical placements, (e) hospital placements, (f) communication and feedback, (g) student autonomy and (h) representing real-life practice.
European Council on Chiropractic Education Commission on Accreditation Insitut Franco-European De Chiropractique (2012)				
European Council on Chiropractic Education Commission on Accreditation (2013a)				
European Council on Chiropractic Education (2013b)				
European Council on Chiropractic Education Commission on Accreditation (2014)				
European Council on Chiropractic Education Commission on Accreditation (2014a)				
European Council on Chiropractic Education Commission on Accreditation (2014b)				
European Council on Chiropractic Education Commission on Accreditation (2014b)				
European Council on Chiropractic Education Commission on Accreditation (2014b)				
European Council on Chiropractic Education				

Author	Objective	Publication type	Setting	Relevant key findings
Commission on Accreditation (2015) European Council on Chiropractic Education Commission on Accreditation Report Anglo European College of Chiropractic (2016a) European Council on Chiropractic Education Report. Bachelor of Medicine and Master of Chiropractic. Universitat Zurich (2016b) European Council on Chiropractic Education Commission on Accreditation (2019a) European Council on Chiropractic Education Commission on Accreditation (2019b)	To propose future scenarios of the chiropractic profession over the next 12 years (2013–2025)	Report	North America; interviews with experts in the field of chiropractic	The paper describes the history of chiropractic and how chiropractic education, including the clinical program, has shaped the profession. The differing views from the evidence-based spinal practitioners to the philosophical wellness and vitalist practitioners are presented. Changes include the shift from accreditation

Author	Objective	Publication type	Setting	Relevant key findings
				<p>requirements to meta-competencies. The report outlines several scenarios for the profession into zones of high aspiration, zones of conventional expectation or zones of growing desperation. Four scenarios were explored: Scenario 1: marginal gains, marginalised field Scenario 2: hard times and civil war Scenario 3: integration and spine health leadership Scenario 4: vitalism and value.</p> <p>Recommendations were made for moving forward. There is a need to expand and improve the clinical training with more types of settings, and more internships in DOD and VA settings, that include IPE and IPP.</p>
World Health Organization (2005)	To provide a consensus document on the basic training guidelines and safety for chiropractic programs	Guideline	Worldwide; X	<p>The guideline provides overall standards and expected competencies for chiropractic programs and graduates. It includes clinical sciences, patient management interventions and clinical documentation requirements. The number of hours required for clinical practicum (internship) is stated.</p>

Note. DOD- Department of Defense; VA- Veterans Affairs; IPE- interprofessional education;

IPP- interprofessional practice

Appendix B. California State Licensing Requirements for Chiropractors



BUSINESS, CONSUMER SERVICES AND HOUSING AGENCY • GAVIN NEWSOM,
GOVERNOR

DEPARTMENT OF CONSUMER AFFAIRS • CALIFORNIA BOARD OF CHIROPRACTIC
EXAMINERS

901 P St., Suite 142A, Sacramento, CA 95814

P (916) 263-5355 | Toll-Free (866) 543-1311 | F (916) 327-0039 |

www.chiro.ca.gov



CHIROPRACTIC COLLEGE CERTIFICATE

NAME OF APPLICANT:

Last

First

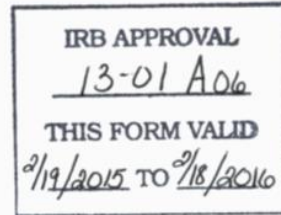
Middle

Subject	Minimum Hours	Hours Completed by Applicant
Anatomy, including embryology,	616	
Physiology (must include	264	
Biochemistry, clinical nutrition,	264	
Pathology, bacteriology, and	440	
Public health, hygiene and	132	

Diagnosis	792 including: 1) E.E.N.T. 2) Serology 3) Dermatology 4) Syphilology 5) Geriatrics 6) X-ray interpretation 7) Neurology	
Obstetrics, gynecology and	132	
Principles and practice of chiropractic	518 including: 1) Chiro.technique 2) Chiro.philosophy 3) Orthopedics 4) X-ray technique & radiation protection 5) 430 clinic hours including office procedures	
Physiotherapy	120	
Psychiatry	32	
Total Hours (include required subjects and electives)	4,400	

Clinical Experience	Minimum Hours	Hours Completed by
1) Physical Examinations	25 (10 NOT student patients)	
2) Urinalysis	25	
3) CBC's	20	
4) Blood chemistries	10	
5) X-ray examinations	30	
6) Proctological examinations	10	
7) Gynecological examinations	10	
8) Patient treatments including diagnostic, adjustive technique, and patient evaluation	250	
9) Written interpretation of X-ray (film	30	
10) Practical clinical experience hours	518	
11) Physiotherapy procedures performed by the student on their own clinic patients	30	

Appendix C. Host Institution IRB Approval



INFORMED CONSENT TO PARTICIPATE IN A RESEARCH STUDY

TITLE OF STUDY: Exploration of Best Practices in Chiropractic Clinical Education.

INVESTIGATOR INFORMATION:

Navine Haworth

Principal Investigator

Telephone No. 24/hr/day-work

I have been asked to participate in the research study under the direction of Navine Haworth, and her supervisors Linda Jones and Sharyn Eaton. I have been told that my participation is strictly voluntary.

PURPOSE:

I understand that I am being asked to participate in this study because of my experience and involvement in the clinical education at [REDACTED]

The purpose of this research study is to provide an insight into your experiences, views and attitudes towards the clinical educational experience. This research study aims will to explore what specific elements are present in clinical education that best prepare interns to work as competent chiropractic practitioners.

It is anticipated that 60 individuals will participate.

DURATION AND LOCATION:

My participation in this study will last for approximately 60 minutes. The study will be conducted at various [REDACTED] Health Center clinics and campus facilities, or via phone or skype interview.

PROCEDURES:

I have been told that I will be asked to engage in a one-on-one semi structured interview or a focus group. All research related interaction will be audio recorded. My engagement in this study is completely voluntary.

Appendix D. Home Institution Ethics Approval



6th March 2013

Linda Jones

Building 201 Level 6, Room 9

School of Health Sciences

RMIT University

Dear Linda & Navine

ASEHAPP 02 – 13 JONES – HAWORTH Exploration of Best Practice in Chiropractic Clinical Education

Thank you for submitting your amended application for review.

I am pleased to inform you that the CHEAN has approved your application for a period of **12 Months** to **March 2014** and your research may now proceed.

The CHEAN would like to remind you that:

RMIT University

**Science Engineering
and Health**

**College Human Ethics
Advisory Network
(CHEAN)**

Plenty Road

Bundoora VIC 3083

PO Box 71

Bundoora VIC 3083

Australia

Tel. +61 3 9925 7096

Fax +61 3 9925 6506

• www.rmit.edu.au

All data should be stored on University Network systems. These systems provide high levels of manageable security and data integrity, can provide secure remote access, are backed up on a regular basis and can provide Disaster Recover processes should a large scale incident occur. The use of portable devices such as CDs and memory sticks is valid for archiving; data transport where necessary and for some works in progress. The authoritative copy of all current data should reside on appropriate network systems; and the Principal Investigator is responsible for the retention and storage of the original data pertaining to the project for a minimum period of five years.

Annual reports are due during December for all research projects that have been approved by the College Human Ethics Advisory Network (CHEAN).

The necessary form can be found at: <http://www.rmit.edu.au/governance/committees/hrec>

Yours faithfully,

Anne Sibbel

Acting Chair, Science Engineering & Health

College Human Ethics Advisory Network

Appendix E. Plain Language Statement and Informed Consent

IRB APPROVAL <u>13-01 A1</u> THIS FORM VALID 02/19/2013 TO 02/18/2014
--

INFORMED CONSENT TO PARTICIPATE IN A RESEARCH STUDY

TITLE OF STUDY: Exploration of Best Practices in Chiropractic Clinical Education.

INVESTIGATOR INFORMATION:

Navine Haworth
Principal Investigator

Telephone No. 24/hr/day-work

I have been asked to participate in the research study under the direction of Navine Haworth, and her supervisors Linda Jones and John Reece. I have been told that my participation is strictly voluntary.

PURPOSE:

I understand that I am being asked to participate in this study because of my experience and involvement in the clinical education at [REDACTED]

The purpose of this research study is to provide an insight into your experiences, views and attitudes towards the clinical educational experience. This research study aims will to explore what specific elements are present in clinical education that best prepare interns to work as competent chiropractic practitioners.

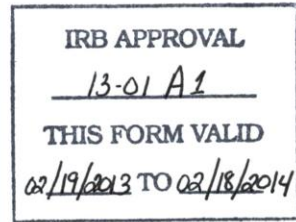
It is anticipated that 50 individuals will participate.

DURATION AND LOCATION:

My participation in this study will last for approximately 60 minutes. The study will be conducted at various [REDACTED] Health Center clinics and campus facilities, or via phone interview.

PROCEDURES:

I have been told that I will be asked to engage in a one-on-one semi structured interview or a focus group. All research related interaction will be audio recorded. My engagement in this study is completely voluntary.



EXCLUSIONS:

I should not participate in this study if any of the following apply to me:

1. I have not had any involvement in clinic related activities as an intern at any [REDACTED] clinic.
2. I am a faculty member of [REDACTED] that does not have any involvement in clinic related roles such as clinical education, clinical coordination or clinical supervision.

RISKS/DISCOMFORTS:

I have been told that the study *does not involve* any risks and/or discomforts, or perceived to be very minimal such as distress of being interviewed.

If I become distressed for any reason during the interview session, I will alert the investigator. I can wish to cease the interview and withdraw, or reschedule to another time.

If I am concerned about my responses to any of the questions or if I find participation in the project distressing, I should contact any of the researchers identified above as soon as convenient.

There also may be risks and discomforts which are not yet known.

BENEFITS:

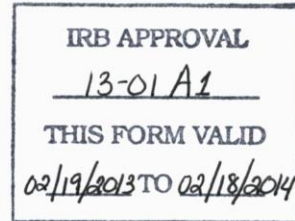
I have been told that I will receive **no direct benefit** from my participation in this study, but my participation may have the potential to improve the education of chiropractors in the future.

CONFIDENTIALITY:

Research records that identify me will be kept confidential in the following ways.

My research records will be kept in a locked file of the Principal Investigator with access limited to the Principal Investigator.

The data from the interviews and focus groups will be secured on the personal USB of the Principal Investigator. The password protected USB will be secured in the locked personal office of the Principal Investigator with access limited to the Principal Investigator. My last name will not be recorded as part of these electronic data records.



Agents of [REDACTED] and RMIT University will be allowed to inspect sections of my research records related to this study.

Every effort will be made to maintain the confidentiality of my research records. The data from the study may be published; however, I will not be identified by name. My identity will remain confidential unless disclosure is required by law.

The Principal Investigator is responsible for keeping my research records confidential for the duration of their existence, five years after the publication of the data. **When my research records are no longer scientifically useful for the purpose stated in this informed consent document, they will be destroyed by shredding, as well as deletion of electronic records.**

FINANCIAL COSTS TO THE SUBJECT:

I will be financially responsible for the costs of my personal transport to and from the [REDACTED] facility chosen for the interview.

COMPENSATION IN CASE OF INJURY:

I understand that in the event of injury resulting from the research procedures, no form of compensation (i.e., payment) is available from [REDACTED]. Medical treatment may be provided at my own expense or at the expense of my health care insurer (e.g., Medicare, Medicaid, BC/BS) which may or may not provide coverage. If I have questions, I should contact my insurer.

RIGHT TO REFUSE OR WITHDRAW:

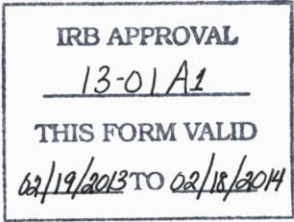
I understand that I do not have to take part in this study, and my refusal to participate will involve no penalty or loss of rights to which I am entitled. I may withdraw from this study at any time without penalty or loss of benefits to which I am entitled.

I also understand that the investigator has the right to withdraw me from the study at any time. I understand that my withdrawal from the study may be for reasons related to me (e.g., not following the study-related directions; a serious study related injury) or because the entire study has been terminated.

OFFER TO ANSWER QUESTIONS:

If I have questions about this study, I may call: Dr. Navine Haworth at (TBA) and [REDACTED]

If I have questions about my rights as a research subject, I may call the Research Department at [REDACTED] at [REDACTED]



If a research related injury occurs, I will call: Dr. Navine Haworth at (TBA)
or [REDACTED]

SIGNATURES:

I acknowledge that I have had read and reviewed the contents of this document. I understand my rights as a research subject and I voluntarily consent to participate in this study. I understand what the study is about and why it is being done.

I may request to receive a hardcopy of this Informed Consent form.

Name of research subject

Signature of research subject

Date

Name of investigator

Signature of investigator

Date

Appendix F. Study Brochure



Research Volunteers

We are seeking volunteers with personal experience of the clinical education provided at [named chiropractic college] as a current intern or new graduate (of less than 3 years since graduation); or faculty member of [named chiropractic college] engaged in clinical education

Time Commitment:

One session of approximately 60 minutes during college business hours , between the dates of March 19-March 29 2013.

What do I need to do as a research participant?

As a faculty member of [named chiropractic college], you will be asked to engage in a one-on-one interview with the principal investigator. Only faculty members involved in clinical education will be interviewed.

As an intern or recent graduate (<3 years since graduation) of [named chiropractic college], you will be asked to participate in a focus group session.

All participants will be voice recorded for their responses

Follow up phone calls or skype interview may be conducted at a later date.

I am interested in becoming a Research Volunteer for the “Exploration of Best Practices in Chiropractic Clinical Education” study.

Phone Number: _____

Email Address: _____

Preferred method of contact

Email

Phone

I understand that my interest in becoming a volunteer does not mean a commitment, merely an interest and opportunity to learn more about participating in this Research Study.

Appendix G. Pilot Questions- Clinical Faculty

Pilot

Clinical Faculty Member Interview Questions

- 1) How is the clinical program conducted at your institution?;
- 2) What do you see as the strengths of the clinical education model/program?;
- 3) What do you see as the weaknesses of the clinical education model/program?;
- 4) What do you see as the students' strengths in the clinical environment?;
- 5) What do you see as the students' weaknesses in the clinical environment?;
- 6) How are students supported in their development in the clinical program? For example, feedback mechanisms, tutorials, assessment?
- 7) How are students appraised/assessed for their competency in the clinic?;
- 8) What elements in your program do you believe are evidence of best practice in clinical education?;
- 9) Have there been any recent changes to the clinical program? Reasons for the change?
- 10) What do you believe distinguishes this clinical program from other chiropractic clinical programs?;
- 11) What are the features that constitute best clinical education of chiropractors?
- 12) What opportunities are provided to enhance real-life clinical experiences?'
- 13) What effect does the clinical program have on the shape of the Chiropractors in the profession and inter-professional context?;
- 14) When do you feel that students are competent and capable?;
- 15) Do you think interns are well prepared to enter the profession after their clinical education?;
- 16) Do you think the clinical program is encouraging an evidence-based approach to patient care and management?;

17) Do you think the clinical program environment is reflective of the professional environment?;

18) Do you feel the interns are prepared to enter into a solo practice environment as a graduate?

Is there anything else you want to add to the discussion?

Interview Questions

Dean of Clinics/Clinical Education Coordinator/Coordinator of Clinics

The questions addressed to faculty members will be conducted via interview.

1. What are the features that constitute best clinical education of chiropractors?
2. What features of best clinical education are evident in your program?
3. What do you perceive the key stakeholders such as accreditation, educational institutions and the profession, see as best clinical education of chiropractors? What the feedback from external third party stakeholders in regards to best practice clinical education
4. How is clinical education conducted at your institution? Theory and practical
5. What do you see as the strengths of the clinical education model?
6. What do you see as the weaknesses of the clinical education model?
7. How are the students supported in their undertaking of clinical education
 - i) in theoretical by their educators
 - ii) in practical by their clinical supervisors?
8. Have there been any recent changes to the clinical education? If so, why?
9. What are the attributes of your clinical program that best prepare the graduate for the health care setting? Clinic mimicking real life
10. What opportunities are provided to enhance “real life experiences” for interns?

11. What do you perceive as to the effect your clinical program has on the shape of chiropractors in the health care setting within the profession and interprofessionally?
Has it changed or influenced any particular changes that you are aware of?

Accreditation

12. What feedback has been provided in your program evaluations to substantiate the program's evidence of best practice?
13. What are the quantitative requirements of hours and number of patient encounters required from your program?
- a. Are they the exact requirements from accreditation? Y/N why?
 - b. Are they in excess of accreditation requirements? Y/N why?
14. Has the institution needed to develop programs/ further content component/ requirements outside and "in excess" of the accreditation standards to provide best practice?
15. When was the institution last accredited? How was the clinical education perceived?
(Any reports would be appreciated)
16. Do you feel that strict abiding by accreditation guidelines and standards has made it difficult to be innovative with clinical education?
17. Do you feel accreditation requirements have hindered some aspects you would like provided in the education?
18. How is your best practice linked to accreditation requirements?

Program Evaluation

19. Have you had a program evaluation? If so, how was the clinical education perceived in the evaluation? (Any reports would be appreciated)
20. How does the institution know that what they are providing in the clinical education is leading to the intended outcome?

21. How are you measuring the effectiveness of the clinical education?
22. How do you ensure students are obtaining graduate capabilities and competencies?
23. With differing models of providing clinical education (such as interprofessional , community based internship etc.); how do you know that these differences are equating to a better practitioner, better prepared? How are you measuring their effectiveness?

Clinical Setting

24. What type and settings of the clinical environment are provided to your interns, such as on campus/institution clinic, community clinic, hospital, outreach/clinical abroad?
25. What setting/s do you provide to best ensure that the intern is exposed to a rich and diverse educational experience and varied patient “case mix”?
26. Do you provide a tiered introduction and exposure of the intern to the differing clinical setting due to the more challenging environments such as the more complex patient presentations?

Assessment

29. What type of clinical assessment/s is/are used to determine competency?
 - a) When are they provided in the education?
 - b) How are they provided? Type of exam
30. Are students required to perform any of the following to support acquisition of knowledge and skills
 - a) written assessments of clinical reasoning,
 - b) standardized patient examinations,
 - c) oral examinations,
 - d) simulations

31. Any qualitative assessment performed in the clinical environment? In the day to day clinic encounter? How, when, why?
32. Is there any peer assessment/self-assessment utilized?
33. Is there any peer mentoring?
34. Are interns required to maintain a portfolio of their clinical work?

Multiprofession and/or Interprofessional exposure and experience

35. Is there opportunity for multi-professional practice in the clinical education?
 - a) If so, in in which setting (private practice, community clinic, hospital setting)
 - b) With what other professions?
 - c) What has been the feedback from the interns in regards to this experience?
36. Is there opportunity for collaborative/inter-professional practice in the clinical education?
 - a) If so, in which setting (private practice, community clinic, hospital setting)
 - b) With what other professions?
 - c) What has been the feedback from the interns in regards to this experience?

Simulation

37. Is there any simulation provided in the clinical education as a learning tool?
 - a) If so, what types of simulation are provided?
38. Is any simulation allowed for clinical requirements?

Feedback

39. What are the formal methods of feedback provided to interns in clinical education?
40. What are the informal methods of feedback?

Appendix H. Pilot Questions- Students

What has been your perception of the clinical program and education provided?;

How do you think the clinical education of this program has prepared you for the professional environment?.

What are the strengths and positive attributes of the clinical program?;

What are the weaknesses/ deficiencies/ negative attributes of the clinical program?;

What opportunities have you found that have provided real-life experiences for you in your internship? What you are expecting as a professional;

What has been the most challenging part of your clinical education experience?;

What qualities of the clinical education experience have enhanced your ability to learn?;

Have you experienced interprofessional engagement in your clinical program? If so, what have been the strengths and weaknesses of this experience?;

Will you be likely to take part in inter-professional engagement when you graduate?

What is your experience with access to a varied case mix?

Appendix I. Pilot Questions- New Graduate

New Graduate Interview Questions

1. How would you describe your experience of the “transition year”? (first year, post-graduation);
2. What are your perceptions, as graduates from the program, of the clinical education provided?;
3. How has it best/least prepared you for professional practice?;
4. What are the strengths and positive attributes of the clinical program?
5. What are the weaknesses and negative attributes of the clinical program?;
6. What has been the most challenging part of your clinical experience now as a professional?;
7. Did you experience engagement in a multidisciplinary/interdisciplinary setting? If so, what were the strengths and weaknesses of this experience?;
8. At what stage in your education did you feel competent?;
9. What was your experience with patient case-mix?;
10. What was your experience with an evidence-based approach in the clinical program?;
11. What was your experience with feedback? Was feedback helpful in your clinical development?;
12. What is your current professional arrangement?;
13. Is there anything that may need to be added to the clinical program to assist future graduates?

Appendix J. Interview Questions- Clinical Management and Leadership

Dean of Clinics/Clinical Management and Leadership member Questions

The questions addressed to faculty members will be conducted via interview

1. What are the features that constitute best clinical education of chiropractors?
2. What features of best clinical education are evident in your program?
3. What do you perceive the key stakeholders such as accreditation, educational institutions and the profession, see as best clinical education of chiropractors? What the feedback from external third party stakeholders in regards to best practice clinical education
4. How is clinical education conducted at your institution? Theory and practical
5. What do you see as the strengths of the clinical education model?
6. What do you see as the weaknesses of the clinical education model?
7. How are the students supported in their undertaking of clinical education
 - iii) in theoretical by their educators
 - iv) in practical by their clinical supervisors?
8. Have there been any recent changes to the clinical education? If so, why?
9. What are the attributes of your clinical program that best prepare the graduate for the health care setting? Clinic mimicking real life
10. What opportunities are provided to enhance “real life experiences” for interns?
11. What do you perceive as to the effect your clinical program has on the shape of chiropractors in the health care setting within the profession and interprofessionally?
Has it changed or influenced any particular changes that you are aware of?

Accreditation

12. What feedback has been provided in your program evaluations to substantiate the program's evidence of best practice?
13. What are the quantitative requirements of hours and number of patient encounters required from your program?
 - a. Are they the exact requirements from accreditation? Y/N why?
 - b. Are they in excess of accreditation requirements? Y/N why?
14. Has the institution needed to develop programs/ further content component/ requirements outside and "in excess" of the accreditation standards to provide best practice?
15. When was the institution last accredited? How was the clinical education perceived? (Any reports would be appreciated)
16. Do you feel that strict abiding by accreditation guidelines and standards has made it difficult to be innovative with clinical education?
17. Do you feel accreditation requirements have hindered some aspects you would like provided in the education?
18. How is your best practice linked to accreditation requirements?

Program Evaluation

19. Have you had a program evaluation? If so, how was the clinical education perceived in the evaluation? (Any reports would be appreciated)
20. How does the institution know that what they are providing in the clinical education is leading to the intended outcome?
21. How are you measuring the effectiveness of the clinical education?
22. How do you ensure students are obtaining graduate capabilities and competencies?
23. With differing models of providing clinical education (such as interprofessional , community based internship etc.); how do you know that these differences are

equating to a better practitioner, better prepared? How are you measuring their effectiveness?

Clinical Setting

24. What type and settings of the clinical environment are provided to your interns, such as on campus/institution clinic, community clinic, hospital, outreach/clinical abroad?
25. What setting/s do you provide to best ensure that the intern is exposed to a rich and diverse educational experience and varied patient “case mix”?
26. Do you provide a tiered introduction and exposure of the intern to the differing clinical setting due to the more challenging environments such as the more complex patient presentations?

Assessment

29. What type of clinical assessment/s is/are used to determine competency?
 - a) When are they provided in the education?
 - b) How are they provided? Type of exam
30. Are students required to perform any of the following to support acquisition of knowledge and skills
 - a) written assessments of clinical reasoning,
 - b) standardized patient examinations,
 - c) oral examinations,
 - d) simulations
31. Any qualitative assessment performed in the clinical environment? In the day to day clinic encounter? How, when, why?
32. Is there any peer assessment/self-assessment utilized?
33. Is there any peer mentoring?
34. Are interns required to maintain a portfolio of their clinical work?

Multiprofession and/or Interprofessional exposure and experience

35. Is there opportunity for multi-professional practice in the clinical education?
- a) If so, in in which setting (private practice, community clinic, hospital setting)
 - b) With what other professions?
 - c) What has been the feedback from the interns in regards to this experience?
36. Is there opportunity for collaborative/inter-professional practice in the clinical education?
- a) If so, in which setting (private practice, community clinic, hospital setting)
 - b) With what other professions?
 - c) What has been the feedback from the interns in regards to this experience?

Simulation

37. Is there any simulation provided in the clinical education as a learning tool?
- a) If so, what types of simulation are provided?
38. Is any simulation allowed for clinical requirements?

Feedback

39. What are the formal methods of feedback provided to interns in clinical education?
40. What are the informal methods of feedback?

Is there anything further you wish to add or discuss?

Appendix K. Interview Questions- Clinical Educators

Clinical Educators Interview Questions

- Q1. How is clinical education conducted at your institution, in regards to theory and practical application exposure?
- Q2. What do you see as the strengths of the clinical education model?
- Q3. What do you see as the weaknesses of the clinical education model?
- Q4. What do you see as the students' strengths in the clinic environment? What are their weaknesses?
- Q5. How are the students supported in their undertaking and development in the clinical education such as feedback mechanisms, tutorials, assessments in the clinics
- iii) in theoretical by their educators
 - iv) in practical by their clinical supervisors?
- Q6. What type of clinical assessment/s is/are used to determine competency? (in the clinic &/or theoretical)
- Q7. What, according to your knowledge, are the components in
- i) the theoretical of the classroom and assessments
 - ii) practical environment of the clinical setting
- that your teaching institutions implemented that constitute best practice of clinical education?
- Q8. Have there been any recent changes to the clinical education/clinic model? If so, why?
- Q9. What do you believe distinguishes this program from other chiropractic programs in terms of the clinical education?
- Q10. What are the features that constitute best clinical education of chiropractors?

- Q11. What opportunities are provided to enhance “real life experiences” for interns?
- Q12. What do you perceive to be the effect your clinical program has on the shape of chiropractors in the health care setting within the profession and inter-professionally?
- Has it influenced any particular changes that you are aware of?
- Is it making a difference outside of the teaching institution?
- Q13. Do you feel they are competent and capable upon entering into the clinical environment?
- i) If they are not competent upon entering into the clinic, when do they feel they are
- Q14. Do you think the interns are well prepared to enter the profession at the conclusion of their clinical education and not necessarily as a sole practitioner?
- Q15. Do you feel the interns are prepared to enter into a solo practice environment at the conclusion of their clinical education?
- Q16. Do you think the clinical education is encouraging an evidenced based approach to patient care and management?
17. Do you think the clinical environment is reflective of the environment they are to expect to operate in as a professional?
- Q18. Is there anything else you would like to add or discuss?

Appendix L. Focus Group Topic Guide- Students

Interns/Students Topic Guide

The following questions are to be provided to interns in a focus group session.

1. What has been your perception of the clinical education provided?
2. Is there sufficient practical time or exposure in the clinic?
3. How do you think the clinical education of this program has prepared you for the professional environment?
4. Are there more challenges than expected in the initial stages when you entered into clinic?
5. Have you entered into private practice or under the guidance of a principal? Or field doctor observations
6. What are the strengths and positive attributes of the clinical program here?
7. What are the deficiencies and negative attributes of the clinical programs?
8. Was the clinical education provided at xxxx a factor for your choice to attend this institution? If so, please explain
9. What opportunities have you found that have provided “real life experiences” for you in your internship?
10. What has been the most challenging part of your clinical experience in your education?
11. Do you think you could function independently in the initial stages as a practitioner?
12. Your clinical model suggests that there is an inter-professional component to the clinical education. Have you experienced this?
 - a. What have been the strengths and weaknesses of this experience?

13. Will you be likely to take part in inter-professional engagement as a professional/post-graduation?
14. What is your experience with access to a varied case mix? Differing case presentations and ages of patients.
15. What do you think had facilitated the access to varied case mix?
16. Which clinical rotations or clinical environments did you find to be most engaging and influential?
17. Which clinical rotations or environments do you find the least engaging and influential?
18. What component of your clinical rotation have you found to be an educationally rich experience?
19. Did you engage in Community Based Internship (CBI)? If so, what were the strengths and weaknesses of this experience?
20. What has been your experience of critical thinking and decision in the clinical environment?
21. What has been your experience of encouragement by faculty towards an evidence-based approach to practice?
22. What has been your experience with feedback from clinical supervisors and/or mentors in the clinical environment?
23. How do you feel in regards to being competent and confident to enter the profession?
24. How do you feel in regards to being competent and confident to work independently as a health care practitioner?
25. How do you feel towards being competent and confident to work in a collaborative clinical setting?

26. Are you encouraged to be a “reflective practitioner”?
27. What qualities of the clinical educational experience enhanced your ability to learn?

Appendix M. Interview Questions- New Graduate

New Graduate Interview Questions

What year did you graduate?

1. How would you describe your experience of the “transition year” (first year post graduation)
2. What are your perceptions, as graduates from the program, of the clinical education provided at xxxx?
3. How has it best prepared you for professional practice?
4. How has it least prepared you for professional practice?
5. Was the clinical education provided at xxxx a reason for your choice to attend this institution?
6. What are their strengths and attributes of the clinical programs? weaknesses
7. Did you experience engagement in a multidisciplinary setting? If so, what were the strengths and weaknesses of this experience?
8. Did you experience engagement in an interdisciplinary setting? If so, what were the strengths and weaknesses of this experience?
9. Are you practicing in a multiprofessional clinical setting?
10. Are you practicing in an interprofessional clinical setting?
11. What aspects of your clinical education best prepared you for your professional practice?
12. Did you engage in Community Based Internship (CBI)?
 - a) If so, strengths and attributes of this experience? Weaknesses of this experience?
13. Did you engage in a preceptorship? externship
 - a) If so, strengths and attributes of this experience? Weaknesses of this experience?
14. Did you engage in a post ceptorship?

- a) If so, strengths and attributes of this experience? Weaknesses of this experience?
15. At what stage in your education did you feel competent? How about confident?
 16. Did you feel competent prior to completing your clinical requirements?
 17. Did you find the campus clinic provide a varied case mix? What setting provided a rich case mix?
 18. In what clinical setting did you experience a variation in patient ages and presentations?
 19. Where did you feel you experienced your richest educational experience clinically?
 20. Was feedback helpful in your clinical development? Please explain your answer
 21. What was your experience in receiving sufficient feedback in the clinical learning environment?
 22. What was your impression in regards to the clinical assessments adequately testing your competencies and capabilities?
 23. What is your current arrangement, independent contractor, associate, sole practitioner, owner of multiple doctor facility?
 24. What assets and strengths in the education did you perceive that seemed to help in your transition to professional practice?
 25. Is there anything that may need to be added to assist future graduates?
 26. Would you feel the clinical experiences provided at this facility were similar or resembled the real world experience of practice? Please explain
 27. Do you often refer to other health disciplines? If so, what particular discipline?
 28. What has been the most challenging part of your clinical experience now as a professional?
 29. Do you feel you were provided with an evidence based approach to patient management?

30. VA residency? What type of clinic in now? Would you like to apply for VA employment?

31. Is there anything further you wish to discuss?

Appendix N. Dent's (2005) and Moore's (2011) Models of Clinical Supervision

Table A.2

Dent's Model of Clinical Supervision in Ambulatory Care Setting

Type of Supervision Model	Description of Supervision
	One student to one clinician
Sitting-in model (Dent, 2005)	The student 'sits in' with the clinician and can usually talk to both the clinician and the patient freely. Students enjoy the 'one-on-one' teaching and the ease of interaction with the clinician, and will see the full range of patients attending the clinic.
Apprenticeship model (Dent, 2005)	The student may be allowed to assume the role of the doctor and interview the patient, with the clinician acting as the observer. Student-patient interaction in this model is obligatory, but as aspects of the consultation may have to be repeated by the clinician, the clinic time becomes prolonged.

Type of Supervision Model	Description of Supervision
Team member model (Dent, 2005)	<p>A more senior student, who is treated like a trainee in the clinical team, interviews and examines patients in a separate room before the student is visited by the clinician or reports back to the main consulting room. In this model, the student can interview and examine patients at their own pace and can discuss aspects such as the effect of the illness on the patient's lifestyle or domestic circumstances. Meanwhile, the remainder of the clinic can proceed at the usual pace with the clinician alone but with intermittent interruptions to review the student's progress. The student will miss the majority of the patients attending during this time, and there are fewer opportunities for interaction with the clinician.</p>
Multiple students to one clinician	
Grandstand model (Dent, 2005)	<p>A large number of students are timetabled for the clinic at the same time and are obliged to crowd around the clinician in a single room to observe the consultation. Although all the students will see all the patients attending, the patients may feel intimidated by the large number of observers and the clinician–patient dialogue may be inhibited. Junior students have a good opportunity to observe the clinician's communication and history-taking skills firsthand, but there are limited opportunities for them to interact with patients themselves. It may be possible to demonstrate some examination techniques.</p>

Type of Supervision Model	Description of Supervision
Supervising model (Dent, 2005)	<p>More-experienced students can conduct an entire interview and examine the patient in independent rooms with only limited tutor supervision. The clinician selects a patient for each student to see individually in a separate room. After a suitable time (during which other patients can be seen), the clinician then goes to each room in turn to hear each student's account of their patient and to supervise various aspects of the interview. Students have the time and space to interview and examine their patient and will receive individual feedback on their performance. However, they do not see all the patients attending, and the clinician is heavily occupied supervising the students and hearing them present information regarding the patient they have just seen. Thus, some of the students' time is wasted waiting for their turn.</p>

Type of Supervision Model	Description of Supervision
Report-back model (Dent, 2005)	<p>Senior students may interview and examine patients independently or in pairs before reporting their consultation findings back to the clinician on their consultation and discussing the proposed management. Patients are allocated to students as in the previous model, but this time the students return, with their patient, to the main consulting room to introduce their patient and present the salient features of their consultation to the clinician and their colleagues. The students have the time and space to interview and examine their patient but, in this model, they will all gain something information regarding other students' patients. A disadvantage from the patient's perspective is the probability of waiting to be seen by the student first and the clinician second.</p>

Type of Supervision Model	Description of Supervision
Breakout model (Dent, 2005)	All the students sit in with the clinician, hear the entire patient interview and observe the examination and following discussion. A student is then allocated to that patient and takes them to another room for further, unsupervised interview and examination. During this time, the student consolidates aspects of their history-taking skills and examination technique and may also have opportunities to complete laboratory request forms or, under supervision, perform a practical procedure such as venepuncture. Subsequent patients are paired with one of the remaining students. This one-on-one experience gives students the opportunity to work at their own pace, but junior students will benefit most if feedback on their individual history-taking and physical examination skills is provided.
Multiple students to multiple clinicians	
Shuttle model (Dent, 2005)	The clinicians consult simultaneously and pass the students among them as cases of interest present. However, the students will miss some patients if the patients happen to attend while the students are engaged with another clinician.
Division model (Dent, 2005)	The student group is divided among the clinicians in the clinic, who may then proceed using any of the previously described models, depending on how many students are attending.

Type of Supervision Model	Description of Supervision
Flip-flop model (Dent, 2005)	The student group spends half of the time with one clinician who may proceed to use whatever model is preferred, but often the grandstand model is the only one that is selected. The teaching session can proceed without pressure as the remainder of the patients attending is being seen by a colleague. At half-time, the students switch to the other clinician.
Tutor model (Dent, 2005)	The student group remains with one clinician who is usually, but not always, the senior clinician. The clinician may use any of the previous models but feels less constrained by the demands of the clinic as an opportunity has now been created to see only selected patients with the students. Patients whom the tutor does not wish the students to see are seen by the other clinicians present while the selected patients are seen in optimal conditions using any of the teaching models described, as resources permit.

Dent, 2005.

Type of Supervision Model	Description of Supervision
Educator sitting-in model (Moore, 2011)	The educator sits in the consultation room during the entire consultation, assisting the student as required. Then, as needs dictate, the student and educator withdraw from the consulting room for a private conversation. This type of education may be more applicable to the examination of a student's clinical performance or when educators want to develop a close understanding of the student's skill level. This method of supervision can be useful for teaching specific skills.

Appendix O. Approved email to participants



EMAIL INVITATION TO PARTICIPATE IN A RESEARCH PROJECT

Dear practitioner,

You are invited to participate in a research project being conducted by RMIT University, in cooperation with xxxxxx Dr. Navine Haworth is a PhD student at RMIT University, being supervised by Dr. Linda Jones and Associate Professor John Reece. The research is being conducted as a component of a PhD research thesis, Doctor of Philosophy. This project has been approved by the RMIT Human Research Ethics Committee. It has also been approved by the Independent Review Board of xxxx. The research is being conducted to investigate several aspects relating to best practices in the clinical education of chiropractors.

We are currently in the process of recruiting new graduates (<3 years) from xxxx only.

As a new graduate practitioner; you have been approached due to your experience and involvement in the clinical education of chiropractors to provide an insight into your experiences, views and attitudes towards the clinical educational experience at your institution.

Review of the literature has shown that there is little research available discussing the best practices associated with clinical education pertaining to chiropractors with small excerpts of best practice being drawn from medical and allied health education. Most of what is adopted as a minimum within the chiropractic education has come from that which is expected from accreditation bodies. This study will explore what specific elements are present in clinical education that best prepare interns to work as competent chiropractic practitioners. The aim is

to critically examine, explore and describe the best practice of the clinical education for chiropractors.

It is expected that 50 individuals will participate.

If you agree to participate in this study you will be asked to complete the anonymous online questionnaire. It is anticipated that this questionnaire will take approximately 20 minutes of your time. Because of the nature of data collection, we are not obtaining written informed consent from you. Instead we assume that you have given consent by your completion and sending of your anonymous survey. Engagement is completely voluntary.

If you have any questions you should contact any of the researchers identified above either by phone or email,

Dr Navine Haworth: navine.haworth@rmit.edu.au +613 9925 6657

Dr Linda Jones: linda.jones@rmit.edu.au +613 9925 7417

Assoc Prof John Reece: john.reece@rmit.edu.au +613 9925 7512

or Anne in the Research Office at xxxx:

Regards

Navine Haworth

Link to the URL to the survey questions here

https://rmit.asia.qualtrics.com/SE/?SID=SV_ewDJY6VQShyXCIZ

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