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ORIGINAL ARTICLE

Australian chiropractic and osteopathic graduates' perceptions of readiness for transition to practice

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ABSTRACT

Objective: This is the second phase of a project. The aim was to explore Australian chiropractic and osteopathic new graduates' readiness for transition to practice concerning their clinical skills, professional behaviors, and interprofessional abilities. Phase 1 explored final year students' self-perceptions, and this part uncovered their opinions after 6 months or more in practice.

Methods: Interviews were conducted with a self-selecting sample of phase 1 participant graduates from 2 Australian chiropractic and 2 osteopathic programs. Results of the thematic content analysis of responses were compared to the Australian Chiropractic Standards and Osteopathic Capabilities, the authority documents at the time of the study.

Results: Interviews from graduates of 2 chiropractic courses ($n = 6$) and 2 osteopathic courses ($n = 8$) revealed that the majority had positive comments about their readiness for practice. Most were satisfied with their level of clinical skills, verbal communication skills, and manual therapy skills. Gaps in competence were identified in written communications such as case notes and referrals to enable interprofessional practice, understanding of professional behaviors, and business skills. These identified gaps suggest that these graduates are not fully cognizant of what it means to manage their business practices in a manner expected of a health professional.

Conclusion: This small study into clinical training for chiropractic and osteopathy suggests that graduates lack some necessary skills and that it is possible that the ideals and goals for clinical education, to prepare for the transition to practice, may not be fully realized or deliver all the desired prerequisites for graduate practice.

Key Indexing Terms: Chiropractic; Osteopathy; Competency-Based Education; Interprofessional Practice

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INTRODUCTION

Final year students' readiness for transition to practice requires them to hold and manage a broad array of knowledge, skills, and attributes. Standards expected for registered chiropractors[1] and the capabilities expected for osteopathic practice[2] are clear and are reinforced by the Australian Health Practitioner Regulation Agency's *Codes of Conduct* for chiropractic[3] and osteopathy.[4]

Other studies have shown that work-integrated learning by Smith et al[5] makes a unique contribution to the 6 dimensions of employment readiness: (1) professional practice and standards, (2) integration of theory and practice, (3) lifelong learning, (4) collaboration, (5) informed decision making, and (6) commencement readiness (confidence to start a job in the discipline).

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This study focuses on the development of professional practice standards in clinical skills, interprofessional practice, and professional behaviors as students transition to graduate practice. There has been a constant national focus on graduate employability in terms of curriculum alignment with learning, assessment, and employability,[5–8] yet little is known about the outcomes of chiropractic or osteopathic programs.

Chiropractic and osteopathy programs in Australia are similar in duration. Chiropractic programs are offered at 5-years of study for a master's degree[9,10] or a double bachelor's degree.[11,12] Osteopathic programs are offered at 5-years for a double bachelor degree,[12] and at 4½ years for a master's.[13,14] The dedicated clinical programs are delivered during the final 2 years of the program. For chiropractic, this is similar to the clinical programs offered in North America, where the internships are performed only during the undergraduate program. For osteopathy,

this is dissimilar to the American clinical internship, which is provided following completion of the undergraduate program, identical to the medical model of internship and residency. Osteopathy and chiropractic students in Australia engage in clinical learning environments comprising university health clinics, community clinical settings, clinical outreaches, and private practices. There are no chiropractic or osteopathy programs with access to hospital clinical placements. On completion of the undergraduate program, graduates of chiropractic and osteopathy are eligible to apply for national registration, which allows them to transition into a private practice setting in any state or territory in Australia.

The standards expected for chiropractors,[1] the capabilities for osteopathic practice,[2] and the Australian Health Practitioner Regulation Agency's *Codes of Conduct*[3,4] outline the professional practice standards that support their professional identity as they transition to practice. Irby[15] speaks of the explicit development of a professional identity as a process that includes the mastery of the competencies together with embracing the behaviors and values of the profession. It is necessary, therefore, to understand to what degree students believe they have a professional identity given that the early stage of professional practice after graduation is an important time for professional identity formation.[16]

In addition to the need to have up-to-date clinical skills and to demonstrate the professional behaviors expected of chiropractors and osteopaths, students are obliged to learn how to practice in an interprofessional manner. The interprofessional practice among health professionals has been a focus of the World Health Organization's continued interest for more than 30 years.[17] Even so, there is little evidence that this has been achieved despite consensus on its value in providing enhanced patient care.[18] That said, there have been some studies about interprofessional learning during clinical education in chiropractic[19] and osteopathy[20,21] by this group of investigators, but they do not explore graduates' perceptions or attainment of interprofessional capabilities.

What is known is that in order to provide a broad and varied student clinical experience and to develop employability skills, chiropractic educators recommend that their students be provided with access and opportunity in both a university health clinic (UHC) (and its equivalent) and a hospital setting.[22] Chiropractic educators have been calling for the expansion of clinical training to diverse clinical settings among different populations for more than a decade.[23,24] There is a dearth of commentary on this matter in the osteopathic literature. With no chiropractic or osteopathic internships on offer in Australian hospitals now or on the horizon, the role of ensuring quality clinical preparation remains with and falls to the UHCs, community, and private practice placements. It is, therefore, vital to know what these sites offer for student education.

In chiropractic and osteopathic programs, like other health education programs, to ensure that the necessary institutional funding is made available, it is necessary to justify important elements of a clinical program. For that reason, it is intended that our contribution provide support for enhanced approaches to clinical education for chiropractic and osteopathy programs. Importantly, it may also support the expanded variety of clinical placements on offer by institutions.

At the time of this study, the 5 areas of ability expected of graduating chiropractors included practicing professionally; communication, collaboration, and leadership; clinical assessment; planning care; and implementing, monitoring, and evaluating care,[1] and these are allocated to the areas of focus of the study (Appendix A). There is no specific interprofessional practice category in the standards; however, it is mentioned as part of Performance Criteria 2.2: demonstrates ability to learn and work effectively as a member of an interprofessional team or other professional groups, including through delegation, supervision, consultation, and referrals.[1]

Although these have since been replaced by 2019 capabilities, at the time of this study, the 6 domains of osteopathic practice outlined in the capabilities for osteopathic practice[2] were clinical analysis, person-oriented care and communication, osteopathic care and scope of practice, primary health care responsibilities, interprofessional relationships and behavior, and professional and business activities (Appendix B).

This 2-phase longitudinal study aimed to explore in phase 1 final year chiropractic and osteopathic students' perceptions of their readiness for transition to practice: their clinical skills, professional behaviors, and interprofessional practices as they perceived them at that time.[25] In phase 2, reported here, the same participants were invited to a second interview, held after their first 6 months in graduate practice. The second interview's objective was to explore their perceptions at that time of the top clinical skills needed in practice, the professional behaviors they recognized as necessary in their work, and how much they engaged with other health professionals about patient care. Interviews explored the areas in which the graduates felt unprepared and sought their suggestions for improvements to the various clinical education programs.

METHODS

A qualitative exploratory descriptive design[26] was adopted as the overarching framework for this research of multiple and repeated case studies with multiple disciplines and universities. Ethics approval was obtained from the Southern Cross University Human Research Ethics Committee: ECN-17-165 in the first instance, and then each of the 3 partner universities applied for minimization of duplication of ethics approval from their respective ethics committees. All participating universities received approval.

Recruitment

In 2018, at recruitment, the student participants were advised of the study's longitudinal nature and asked to provide contact details for the 2019 interviews. Contact details were provided by all phase 1 participants. As agreed, in 2019, the graduates were contacted via e-mail

and or phone by the same interviewer to arrange the second interviews. If no response was received after the first invitation, they were contacted by e-mail or SMS twice more, and if still no response was received, they were not contacted again.

Interviews

Phase 2 interview questions flowed logically from phase 1 questions and responses. Phase 2 interview questions were assessed for validity among a reference group of new graduates who were not part of the study.

Part 2 interview questions were designed to explore graduates' perceptions at that time about the top clinical skills needed in practice, what professional behaviors they recognized as necessary in their work, and the range of other health professionals they work with when managing patient care. The intent was to identify areas in which the graduates felt unprepared and to glean their suggestions for improvements of the various clinical education programs.

To ensure that the data collected remained confidential, as in phase 1, each partner institution was provided with a separate online interview data collection tool developed in Qualtrics software.[27] Each interviewer was provided access only to the university participants they were nominated to interview. All members of the research team undertook interviews.

The interviews were conducted using Zoom (Zoom Video Communications, San Jose, CA, USA)[28] meeting capability, which allowed both the interviewer and the interviewee to read the interview questionnaire. This allowed the interviewer to confirm that the interviewee understood the question and enabled the interviewer to ask extended questions and clarify responses as needed. The interviewer populated the questionnaire template in real time.

Conducting interviews on Zoom in this manner reduced both the time and the costs involved in data collection; it also permitted real-time, in situ member checking because the interviewee could see and consent to what was being recorded; thus, there was no need to record the Zoom session. This meant no additional costs for transcribing interview data and no downtime with the project before analysis could commence. All interviewers found this method of interview and real-time member checking superior to methods they had used in the past, as it strengthened participant engagement and built good relationships.

It is not clear whether those who declined to participate did so, as they were not as yet engaged in professional practice. The aim was to have a 100% response rate by the phase 1 interviewees, and achieving 50% of the target number of participants was difficult. Nevertheless, the interviewer in each case study felt that each interviewee responded much the same across all the cases. Thus, the team felt strongly that data saturation had been reached.

Analysis

Responses to interview questions were manually analyzed for themes initially by the interviewer before being shared among the research team for confirmation of interpretation of findings. Coding, themes, and the general approach to analysis were discussed until no new themes or categories were uncovered. At this point, it was agreed that consensus had been reached.

Table 1 - Participants by University and Discipline

University	Discipline	Student Interviews, *n*	Graduate Interviews, *n*
A	Chiropractic	8	2
B	Chiropractic	7	4
C	Osteopathy	6	4
D	Osteopathy	7	4

Lists provided by participants regarding their top clinical skills and professional skills were analyzed for alignment with the descriptors of chiropractic standards[1] and osteopathic capabilities.[2] In the thematic comparative content analysis, rather than taking a literal approach to the interpretation of the clinical skills and professional behaviors listed by the participants, we adopted a broad interpretation of their lists that made it possible to include as many of the graduates' lists as possible. Comparisons were not made between universities. Aggregated data and quotes from participants are presented below. To reduce research bias, each analyst consciously brought critical and reflective thinking to their inductive analysis.[29,30]

The development of competence and capabilities is best viewed as a continuous process of development. Learners move through a sequence of stages as they develop, with their awareness developing from feeling unconsciously incompetent to consciously incompetent to consciously competent to unconsciously competent.[31] In the Discussion section, this developmental framework is used to illustrate awareness and acquisition of competence and capabilities.

RESULTS

Demographics

Fourteen of the original ($n = 28$) participants engaged in phase 2 interviews. That is, data were obtained from graduates at 4 Australian universities: chiropractic participants attended university A (UA) and university B (UB), and osteopathic participants attended university C (UC) and university D (UD). Total participants in phase 2 were from 2 chiropractic courses ($n = 6$) and 2 osteopathic courses ($n = 8$). To protect identity in these small cohorts at each university, age and gender details were not collected (Table 1).

Results from universities showed UA with the lowest follow-up response rate despite being the largest participant cohort for phase 1. It is not known whether those not participating in phase 2 were not engaged in clinical practice, thus influencing their decisions not to participate. We were informed of 1 participant from UC being ineligible to participate in phase 2 because circumstances had hindered studies, and the student had not graduated on time.

Table 2 - Employability Arrangement

University	Student No.[a]	Arrangement
A	1	Part-time, starting own clinic, part-time another practice sole trade
	2	Part-time, practice, part-time higher degree research-honors student
B	3	Full-time, an independent contractor
	4	Full-time, an independent contractor
	5	Part-time, starting own clinic, part-time another practice sole trader
	7	Full-time, a sole trader, starting own clinic
C	1	Full-time, an independent contractor
	2	Part-time, employee associate
	5	Full-time, an independent contractor
	6	Full-time, an independent contractor
D	2	Part-time, partnership
	3	Part-time, associates in an existing clinic
	4	Part-time, starting own clinic, part-time another practice
	6	Full-time, employee/associate

[a] For consistency with the already published paper, the student numbers align with the participants as described in phase 1.

Table 2 shows the extent to which graduates were employed. The results are recorded against their student number in phase 1.[25] Phase 2 data (Table 2) show that 8 worked full-time and 6 part-time in their discipline.

Readiness for the Transition to Practice

Graduates were asked to rate their perception of their preparedness for transition to practice on the same Likert scale used in phase 1, which ranged from extremely well, very well, moderately well, slightly well, to not well at all. Table 3 shows that after 6 months in practice, 4 graduates felt they were less prepared than when they did as students, 2 felt no different from when they were students, and all others felt that, on looking back, they were better prepared than they thought they were when they were students (Table 4).

Many graduates also made positive comments about their respective clinical education programs, especially regarding learning clinical skills. Most were satisfied with their attainment of verbal communication skills and acknowledged that their capabilities and confidence had improved with more practice. Also, many mentioned that their manual therapy skills were their strongest aspects of preparedness.

Ten graduates recommend that today's students be proactive: go out from the UHC and engage with members of their profession in fully functioning private practices. Nine—from UA ($n=2$), UB ($n=1$), and UC and UD (each $n = 3$)—advised today's students to observe private practitioners to gain experience. Six—from UB ($n = 1$), UC ($n = 1$), and UD ($n = 4$)—advised others to do an internship in a private practice setting.

Tables 5 and 6 show the chiropractors' list of the top 3 clinical skills needed in practice and the top 3 professional behaviors. Tables 7 and 8 show the osteopathic participants' lists. All tables show the lists they provided in phase 1, when they were final year students in 2018, and the lists they provided after 6 months in practice, in 2019. Responses are compared to the descriptors of chiropractic standards[1] and osteopathic capabilities.[2]

Chiropractors' Clinical Skills

Table 5 shows the top 3 clinic skills listed by chiropractors before or after graduation. Most of the 34

Table 3 - Graduates' Sense of Preparedness for Transition to Practice

University	Student	Final Year	Graduate	Difference
A	1	Very well	Very well	No change
	2	Moderately well	Very well	More prepared
B	3	Very well	Not well at all	Less prepared
	4	Moderately well	Slight to moderate	Less prepared
	5	Moderately well	Slight	Less prepared
	7	Very well	Moderately well	More prepared
C	1	Slightly well	Not well at all	Less prepared
	2	Very well	Extremely well	More prepared
	5	Very well	Moderately well	More prepared
	6	Very well	Moderately well	More prepared
D	2	Moderately well	Moderate to very well	More prepared
	3	Moderately well	Moderate to slightly	Less prepared
	4	Moderately well	Moderately well	No change
	6	Not well at all	Moderately	More prepared

Table 4 - Comments About the Sense of Preparedness for Transition to Practice

University	Student	Postgraduation
A	1	"Very well—From a business perspective and a practice perspective."
B	3	"Not that the education was not good, it's just such a big transition to real practice. I was prepared as I could be but it wasn't enough."
	4	"Slight to moderate—(not, not well), I had a lot of time off after uni waiting for rego. That took 2 months and I lost momentum. It takes 1 to 2 months to get up to speed. The uni prepared us for diagnosis and treatment, but not for the realities of practice. Purely because of the length of time of appointments are shorter in practice, not long like in the clinic at uni. It has taken me a long time to bring that down."
	5	"Slight to not well—[started own clinic] The business setup/record-keeping was unknown. Australian Chiropractors Association has guides. Marketing is difficult."
C	1	"Not well at all—Paperwork, high-caps number, registering to practice with Vets."
D	3	"Moderate to slightly—I thought I was well prepared but there was a lot to learn."
	6	"Moderate overall—but given you have had no support in these initial months I think I did very well. I'm happy. If you compare the osteopath, I was 6 months ago to now, I was only moderately prepared when I left uni."

clinical skills listed as the top 3 clinical skills by the cohorts aligned with the standards. Student 1, UA's choice, represents a change from patient focused to practice management focused. However, looked at as a whole, there were minimal differences among the list that participants gave as final year students compared to the list provided after time in practice.

Chiropractors' Professional Behaviors

Table 6 shows most of the skills listed as the top 3 professional behaviors were clinical skills with just a small number of professional skills: business, marketing, management, continual learning, and professional presentation. Student 1 at UA's list shifted to interprofessional thinking after time in practice, similar to student 7 UB. Student 4 UB's list postgraduation indicated an awareness to manage the consultations more effectively. Student 5, with the same list as a graduate, indicated an awareness to manage the self. Table 6 shows 3 chiropractors' listed interprofessional communication as professional behavior.

Osteopaths' Clinical Skills

Table 7 shows that of the 48 clinical skills listed by the osteopaths, 47 aligned with the listed clinical competencies required in practice. Looked at as a whole, the lists contained many references to communication skills with 5 graduates stating assessment/diagnosis as important (students 1, 2, and 3 UC and students 2 and 3 at UD).

Osteopaths' Professional Behaviors

Of the 45 professional skills listed in Table 8, few could be allocated as professional skills because the majority were clinical skills. Of the professional skills listed, most were concerned with boundaries or continuing education, with 1 mention of ethical behaviors.

In a change of emphasis from the time when they were in the final year, 4 of the graduates listed business type skills (students 1, 2, and 5 at UC and student 2 at UD) or time management (business practices), 1 listed professional relationship (student 4 at UD), and another listed ethical behavior (student 6 at UD). Table 8 shows that student 6 UC mentioned interdisciplinary knowledge as a professional skill when in the final year.

Gaps in Preparedness

Graduates reported a variety of struggles, as discussed below.

Written Communication

Few of the graduates reported issues with their verbal communication abilities. As far as written communications, even though some graduates reported writing referral letters as part of their clinical training in the UHC, over 50% of the graduates (UB, $n = 2$; UC, $n = 3$; UD, $n = 4$) state that they lack experience in several key areas of written communication. These include business correspondence—either paper-based or electronic case notes required to deal with normal as well as third-party requirements, such as motor vehicle accidents, Department of Veterans Affairs, and enhanced primary care. One said that, in practice, "I've turned people away because I was daunted by the paperwork. Unprepared with the business side of the practice. MVA, EPC, DVAs which make up a lot of income" (chiropractor 1, UB).

Some graduates felt that the UHCs, still having paper-based record-keeping as opposed to electronic, had not prepared them adequately for the real-world experience, especially when using electronic health records (student 1, UC). For some, the note taking did not seem focused enough or standardized (student 6, UD). For this reason, they felt that they learned more about note taking and industry standards from those in the field as opposed to in the university environment. Reports of inconsistent approaches between clinical supervisors in the UHC made the clinical note taking the most unclear and problematic area for them as students. One said, "If I had my time over again, I would avoid those clinicians, because they did not seem to be industry standard" (osteopath 6, UD).

Table 5 - Chiropractic Participants' List of Top 3 Clinical Skills

University	Student	Final Year			Graduate		
A	1	Good history taking	Relating to client	Treat appropriately	Manual skills	Business skills*	Marketing*
A	2	Clinical knowledge	Communication	Staying on top of the evidence	Case history taking	Diagnostic skills	Patient-centered care
B	3	Communication	Manual therapy	Patient education	Manual adjusting	Communication	Differential diagnosis
B	4	Communication	Manual therapy	Marketing*	Communication	Quick decisions	Manual therapy
B	5	Communication	Knowledge	Manual therapy	Communication	Confidence	Manual therapy
B	7	Communication	Red flag/pathology	Manual therapy	Communication	Manual therapy	

* Asterisk indicates a Professional Skill.

Table 6 - Chiropractic Participants' List of Top 3 Professional Behaviors

University	Student	Final Year			Graduate		
A	1	Confidentiality in communication with other health professionals	Being up to date	Communication	The level to which we need to communicate with other health practitioners; more detailed than I thought it would be		
A	2	Responsibility Knowing when you know it's out of your scope	Professional	Building rapport with the patient	Communication with other professions	Patient-centered treatment	
B	3	Confident decisions	Independence		Communication	Manual adjusting	Marketing/advertising*
B	4	Composure	Interprofessional communication	Professional presentation*	Ability to manage difficult decisions	Empathy	Efficient consultations
B	5	Continuing to learn	Patient centered	Communication	Determination/resilience	Get a mentor	Self-starter/initiative
B	7	Communication	Professional relationship	Continuing learning*	Communication	Networking	Budget management

* Asterisk indicates a Professional Skill.

Table 7 - Osteopathic Participants' List of Top 3 Clinical Skills

University Study	Student	Final Year			Graduate		
C	1	Treating dysfunction	Efficient/effective	True to osteopathy	Effective treatment	Diagnostic skills	Organization skills
C	2	Communication	Patient management	Time management	Communication	Clinical reasoning	Diagnostic skills
C	5	Communication	Diagnosis in room	Able to treat	Clinical reasoning/diagnosis	Manual therapy	Communication
C	6	Palpation	Anatomical knowledge	Empirical research	Palpation	Osteopathic technique	Interpersonal/ communication skills
D	2	Communication	Assessment treatment	Continued education*	Communication	Manual skills	Diagnostics
D	3	Communication	Time management	Continue learning	Appropriate assessment	History taking	Manual treatment
D	4	Communication	Examination skills	Treatment skills	Communication	Clinical reasoning	Time management
D	6	Communication	Clinical reasoning	Palpation	Build rapport/ communication	Awareness of common conditions	Clinical note taking

* Asterisk indicates a Professional Skill.

Table 8 - Osteopathic Participants' List of Top 3 Professional Behaviors

University	Student	Final Year			Graduate	
C	1	Respectful advocate	Creating a clear pathway for patients	Nonjudgmental	Communication	Tax and business*
C	2	Communication	Patient handling	Being safe	Time management	Communication/ consent
C	5	Communication	Not condescending	Boundaries*	Communication/ referrals#	Business management*
C	6	Understand boundaries*	Anatomic knowledge	Interdisciplinary knowledge#	Interpersonal skills	Listening to patient
D	2	Listening/openness	Nonjudgmental	Walk the talk	Communication	Patience
D	3	Adequate training	Communication	Interpersonal skills	Communication	Time management
D	4	Being respectful	Confidentiality	Keep up to date	Communication	Build rapport
D	6	Being personable	Biopsychosocial	Being personable	Communication with other practitioners#	Communication

* Asterisk indicates a Professional Skill.
# Hash indicates an Interprofessional skill.

Interprofessional Practice

All participants were asked about the type of clinical facility they were currently practicing in, revealing that many worked in clinics with other types of health professionals. They were asked if they referred out to other practitioners or received referrals. The graduate chiropractors report they make referrals to other chiropractors ($n = 1$), general practitioners ($n = 4$), myotherapists ($n = 1$), strength and conditioning coaches ($n = 1$), and radiologists ($n = 2$). Also, they receive referrals from general practitioners ($n = 4$) and myotherapists ($n = 1$). The graduate osteopaths report they make referrals to general practitioners ($n = 6$), myotherapists ($n = 2$), exercise physiologists ($n = 1$), psychologists ($n = 1$), podiatrists ($n = 2$), and radiologists ($n = 2$). They receive referrals from general practitioners ($n = 2$), fitness trainers ($n = 1$), nurses ($n = 1$), and exercise physiologists ($n = 1$).

The most commonly cited referrals were to a general practitioner (GP). The interprofessional engagement in this instance was often unidirectional—an experience of both osteopaths and chiropractors. One commented, "If I refer a patient back to their GP, I don't hear directly from the GP. The patient passes on the information" (osteopath 4, UD).

Some suggested that the university "get more interprofessional collaboration going. Not just osteo and Chinese—more people in a sporting environment, etc.—a variety of practitioner, eg, psychology" (chiropractor 1, UA).

Another suggested that the university "do more independence near the end of the training—to build confidence. If you are going to be out on your own, we need help in preparing for that. Discuss with coworkers. Respond to the GPs. Chronic Disease Management Plan" (osteopath 5, UC).

Alluding to a missed opportunity to learn about referrals when undertaking an observational clinic placement in a private clinic, osteopath 1 at UC said there was "no time to discuss [with the registered osteopath] anything to do with referrals."

Scheduling and Clinical Reasoning

Other areas of difficulty included reducing the time of consultations and scheduling, claimed student 3 (UB), and others said, "We were not prepared well in time management. Treatment times were longer in the student clinic. We did not have back-to-back appointments in the UHC. We were expected to stay back and do our notes. Now if we don't do notes as we go—we work overtime for no pay" (osteopath 4 UD), and "They teach us to be safe chiropractors, and that's a good thing. They don't teach us to be efficient chiros in an associate setting or private clinic. . . . In practice, we run 20 to 30 minutes for new patients and 15-minute appointment times for return visits. In the UHC it was 1.5 hours for a new patient and 30 to 45 minutes for a return visit" (chiropractor 1, UB).

Some participants reported struggling with clinical reasoning and other aspects of the consultation (student 4, UB; student 1, UC; and students 2 and 3, UD). The latter said, "I struggled to put the history assessment into a

diagnosis and developing that into a treatment. I don't feel we did that much; we did a lot on assessment but not translating that into what does that mean clinically and what does that mean to the treatment plan" (osteopath 3, UD).

Business Management

Although 1 interviewee said they were prepared well in a business sense (chiropractor 1, UA), this person had previously run a similar business. One other agreed (chiropractor 3 UB); however, more disagreed (chiropractors 4, 5, and 7, UB, and osteopaths 1 and 5, UC), stating that they felt they needed more training in business and/or marketing on the implications of employment types and financial arrangements and tax implications. One wrote, "We were not prepared for how long it takes to build a client base. We never went through anything about leases, rentals, how to protect yourself" (chiropractor 1, UB). Another wrote, "It would be good for the unit to discuss more employment situations, different types. What we had was superficial" (osteopath 6, UD). Yet another wrote, "The curriculum did not prepare us to be a sole trader. . . . Experience in the field under a mentor is probably necessary. . . . And, the uni clinic is regimented, and it fragments your process. . . . It's the processes that are involved interrupt your flow of learning" (chiropractor 1, UA).

One aspect to this lack of preparedness may stem from the way the UHC was run. Sentiments we heard regularly in phase 1 were echoed in phase 2 by an osteopathic graduate who said,

> It is much appreciated what the clinicians do for us with the time they have. It's not appreciated until they are not there. We have access to amazing knowledge at uni but we don't have the clinical cases to apply it to due to the poor numbers of real patients. A lot more workshops and practical sessions would be good. High student-to-supervisor ratios was difficult. When the supervisors had the time and could be in the treatment room with us, we'd get a lot of insight and clinical pearls—they would have a different lens to view it through and would expand our eyes from a straight musculoskeletal lens to an osteopathic lens. When the clinicians had this time, we could talk things through more—it was more fluid. Because so much "depends." When the clinician had this time, we had a continual dialogue, not a stop-start dialogue. The fluid dialogue would lead you down different avenues to approach the problem—the result was a deeper understanding of the assessment approach and treatment choices/plan. No one consistently tied the osteopathic principles into what we were doing in the clinic. The clinicians were short of time. Lots of emphasis on getting our diagnostics right and notes right and treatment theory only, not why, how, and bring it all together. When clinicians were unapproachable, we dialogued with them less—therefore learned less. (osteopath 2, UD)

DISCUSSION

In the main, graduates reported that, looking back, they were better prepared for practice than they originally thought they were when they were in the final year. Most graduates felt consciously competent in terms of their manual skills and diagnostic abilities. A few noted that they lacked confidence in developing management and treatment plans, which may be due to a lack of experience in diverse and complex cases. The clinical integration of understanding of prognosis and how this links with all the aspects, including the patient history, assessment, diagnosis, and treatment, is a necessary aspect of practice as stated in both the standards for chiropractors[1] and the capabilities for osteopaths.[2]

Record-keeping requirements are an essential aspect of practice in both chiropractic and osteopathic practice, yet knowledge of business communication is a gap given that graduates report their lack of confidence in several key areas of communication: in business correspondence, patient relations, and referrals, they were consciously incompetent.

They reported being challenged by time management and clinical note taking. For some, their preparation in note taking had been time consuming and detailed and had not prepared them for practice. Many felt that they were learning more about case notes and industry standards after graduation than they had while still studying. Familiarity with the management of the paperwork related to accepting referrals and making referrals to other practitioners is a key component of the ability to work interprofessionally to provide patient-centered care.

Poor communication among health professionals can lead to compromised safety and inefficient use of resources, among other issues.[32] Communication between caregivers should feature more prominently in preprofessional training.[32] Thus, the development of graduates' basic business skills, such as the development of communication skills between caregivers as well as time management, marketing, and generally managing a practice, needs to be reviewed in the preprofessional curriculum in these disciplines. It has been previously stated that chiropractic training and education programs are falling short in providing adequate business training. The profession needs significantly greater business and practice management skills; there exists a gap between required business skills and their existing skills.[33] Some were aware of a "professional identity" but were not clear or competent in their understanding of that identity; thus, they were unconsciously incompetent throughout the study regarding the professional behaviors expected of them. Perceptions of what the participants thought constituted the top 3 professional behaviors are inconsistent with both the standards for chiropractors[1] and the capabilities for osteopaths.[2]

In phase 1, it was evident that participants were unconsciously incompetent in terms of their interprofessional practice. Data showed students lacked preparedness for interprofessional practice—that interprofessional education was ad hoc and not formalized.[25] This lack of exposure became obvious as graduates when many said they could not manage the written communication systems as stated above; thus, they were consciously incompetent,

even though the majority indicate they do refer out and accept referrals from other health professionals.

Graduates in both disciplines report they refer to radiologists and GPs and receive referrals from GPs via enhanced health care plans, which is a mark of interprofessional practice and patient-centered care, and about this paperwork, they were consciously incompetent. Perhaps these skills are better learned when students spend time in private practices, such as internships, where they meet more complex patients rather than in the UHC.

The findings from phase 2 confirm phase 1 that the UHC provided downtime with few patients scheduled. This did not challenge them to be efficient and to complete clinical records within the time of the patient encounter, which is standard for professional practice. It was identified that in the community clinics and the private practices, they encounter different cultural groups and patients with more complex health care needs and were thus able to develop clinical skills and communicate as a health practitioner to a stranger.[25]

Even though all participants had high regard for their clinical supervisors, in the chiropractic community programs, participants reported that clinical supervisors were providing a different perspective to chiropractic practice that contravened what was taught in the university program. This included different types of chiropractic techniques and approaches to patient care that were not part of the curriculum. Anecdotal evidence suggests the same might apply to osteopathic supervisors as well, but we have no actual data collected in this study. That said, some participants reported that they were not exposed to enough variety of styles of practice. Experiences of practices and techniques contrary to what they were previously taught give young graduates enhanced opportunities to actively seek answers and clarify best practice rather than passively accept or reject such unfamiliar practices.

Analysis of data from phases 1 and 2 inferred that some participants seemed uncomfortable with the degree of variation among clinical supervisors and were unable to adapt to different approaches, wanting a standard approach for every situation instead.

Registered chiropractors and osteopaths apply their clinical knowledge skills in a variety of different ways in different situations, and students need to be cognizant of this. However, there are always limitations to the amount of content in any curricula, and registration authorities and course accreditors expect curriculum leaders at the different universities to construct the content in a way that provides the students with a broad introduction to the discipline. The curriculum is designed around core discipline knowledge, which is developed through learning and teaching activities that ensure that students meet current capabilities and competencies and thus that they apply what they learn at the university safely. However well-meaning those clinical educators' intentions, to inform students of the manner of practice that clinical educators find useful is to embed their own "hidden" curriculum into the formal curriculum. What may be thought of as inadvertent actions is likely a breach of the trust placed in them. Educator training may ensure more consistency in approaches and potentially reduce confusion.

Commentary by Ebrall and colleagues[34] illustrates the discrepancies that can prevail in the clinical program when those responsible for students' clinical development and patient care are not adequately informed of the curriculum. This may impact the students' clinical learning experiences when this is driven by the (n=1) of their clinical educator and their beliefs. This emphasizes the need for up-skilling and informing the clinical educators of a level of consistency and uniformity.[34] Professional registration does not necessarily prepare a practitioner in clinical supervision, education, and mentoring of student interns.

It was identified in both phase 1 and phase 2 that participants' perception of readiness to transition to practice was sufficient in terms of the development of core clinical skills. However, analysis has identified that they lack a clear vision of the gamut of their professional roles in terms of professional behaviors and interprofessional responsibilities. Thus, they were unconsciously incompetent before graduation, and afterward, they were consciously incompetent in some areas needed for graduate practice, such as clinical paperwork. Therefore, a review of the teaching and assessment of interprofessional competencies, particularly the required written communication skills, is recommended. In addition, a review of the clinical curriculum for alignment with the development of professionalism is needed via real-time, in situ, clinical assessments to ensure that students practice accordingly.

Monitoring of the incremental acquisition of clinical skills, professional behaviors, and interprofessional capabilities, also known as threshold knowledge, building blocks, behaviorally based milestones,[35] or entrustable skills, requires regular examination to identify students who need extra support.[36] In medical education, Govaerts and colleagues suggested the assessment concepts of multisource feedback,[37] workplace-based assessment,[38] reflection and portfolio[39] assessment, and a programmatic approach to assessment as yardsticks for any course of education involving health professionals. Even though a review of the assessment strategy for the chiropractic and osteopathic clinical curriculum was not within the scope of this project, it is, nevertheless, recommended that future research explore the reliability and validity of the clinical assessment strategy and tools as suggested in recent osteopathic papers.[40–44]

Limitations of the Study

Longitudinal studies, while offering opportunities to investigate change over time, are challenging in that they suffer from participant attrition. It is not clear why those who declined to participate did so. It could be that they were not as yet engaged in professional practice.

Participants' perspectives and comments were taken at face value. Neither the faculty perspectives of the clinical education program outcomes nor the students' achievement of the desired competencies and capabilities were

explored. Clinical assessment tools were also not reviewed as part of this exercise. These elements would add to what is known about the quality of the clinical education programs at each institution and should be considered in future research.

CONCLUSION

Overall, graduates reported that looking back they were better prepared for practice than they originally thought. When compared to the standards for chiropractic practice[1] and capabilities for osteopathic practice,[2] this cohort of graduates regard themselves as being well prepared in most clinical skills and in particular in verbal communication skills and manual therapy techniques. However, they report not being adequately trained in the necessary written communication skills in general and for interprofessional practice. This includes the different types of paperwork (paper based and electronic) required to deal with third-party requirements, such as motor vehicle accidents, Department of Veterans Affairs, and enhanced primary care plans, which, while possibly not expected to be learned in the UHCs, may be a feature of the business of community clinics but are a feature of private practice. Thus, it appears graduates are not fully prepared for interprofessional practice and may be deficient when it comes to the implementation of patient-centered care.

Furthermore, in the main, graduate participants and the final year students were unable to articulate what professional behaviors were expected of them. The identified gaps suggest these graduates are not fully cognizant of what it means to manage their business practices in a manner expected of a health professional.

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APPENDIX A. CHIROPRACTIC STANDARDS

Clinical Skills

- Universal competency 2—communication, collaboration, and leadership: communicates and collaborates effectively at all times with patients and others
- Practice competency 3—clinical assessment: understands patients' health status and related circumstances; critically analyzing these and forming a clinical impression
- Practice competency 4—planning care: works in collaboration with patients, exploring the care options available and developing agreed, evidence-based care and management plans
- Practice competency 5—implementing, monitoring, and evaluating care: coordinates the safe and effective implementation, monitoring, and evaluation of patients' care and management plans

Professional identity

- Universal competency 1—practicing professionally, ethically and legally with safety and efficacy and with the application of evidence-based practice as the primary consideration in all aspects of chiropractic practice

APPENDIX B. CAPABILITIES FOR OSTEOPATHIC PRACTICE

Clinical Skills

- Clinical analysis—everything to do with the assessment of a patient, clinical reasoning, treatment and management plan, and recognition of situations in which further information is required
- Person-oriented care and communication
- Osteopathic care and scope of practice—the application of osteopathic principles.

Professional Identity

- Primary health care responsibilities—awareness of the broader health system, costs of health care, adherence to ethical standards, recognizes own limitations as a primary health care provider
- Professional and business activities—the currency of knowledge, self-care, and confidentiality; adheres to regulatory and ethical-legal responsibilities and requirements regarding the practice environment

Interprofessional Practice

- Interprofessional relationships and behavior—working with other osteopaths and professionals to improve health care outcomes and engage in efficient communication systems of referrals