

A qualitative study investigating research priorities and investigative capacity in sports-focused chiropractic research, part 2: exploring the challenges and opportunities for research capacity development

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Objectives: *To explore the challenges and opportunities for research capacity development in the sports chiropractic field.*

Methods: *A qualitative description study was conducted using semi-structured interviews with 20 sports chiropractic researchers from eight countries and focus group interviews with 12 sports chiropractic leaders from Canada.*

Results: *Challenges and opportunities for research capacity development were identified within four main*

Une étude qualitative visant à examiner les priorités de recherche et la capacité de mener des enquêtes dans la recherche en chiropratique sportive, partie 2: exploration des défis et des opportunités pour le développement de la capacité de recherche.

Objectifs: *Explorer les défis et les opportunités pour le développement des capacités de recherche dans le domaine de la chiropratique sportive.*

Méthodes: *Une étude de description qualitative a été réalisée à l'aide d'entretiens semi-structurés avec 20 chercheurs en chiropratique sportive provenant de huit pays, ainsi que d'entretiens en groupe de discussion avec 12 chefs de file en chiropratique sportive du Canada.*

Résultats: *Des défis et des opportunités pour le développement des capacités de recherche ont*

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themes – 1) affiliations and collaborations, 2) human resources, 3) financial resources, and 4) operational resources. Profession-specific challenges included being “siloeed”, a lack of knowledge of the chiropractic profession, and its negative perception. Profession-specific opportunities included creating a sports chiropractic research chair/centre and engaging sports chiropractors in practice- and field-based research networks.

Conclusions: *These results can inform strategies to advance research capacity development for the sports chiropractic field and develop context-specific indicators for ongoing research capacity assessment.*

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KEY WORDS: Research Capacity, Sports, Chiropractic, Qualitative Research

Introduction

Research in healthcare advances knowledge to support evidence-based care to improve patient outcomes.¹ With evidence indicating clinician engagement in research is associated with improvements in healthcare delivery^{2,3}, health professions play an important role as research partners in healthcare systems to benefit society. To meet this challenge, the Research and Education Committee of the Royal College of Chiropractic Sports Sciences (Canada) (RCCSS(C)) launched the “Advancing the Research Effort for Canadian Sports Chiropractors Initiative” to improve its ability to make meaningful research contributions.

Commencing in 2016, this initiative is an on-going research program with the aim of conducting a range of investigations to inform continuous strategy development to improve the research impact potential of the Canadian sports chiropractic field. The first investigation was an exploratory interview study to provide an initial understanding of the research needs and preferences of Canadian chiropractors practicing in sport.⁴ These practition-

été déterminés dans quatre thèmes principaux : 1) affiliations et collaborations, 2) ressources humaines, 3) ressources financières et 4) ressources opérationnelles. Les défis spécifiques à la profession comprenaient l'isolement, le manque de connaissance de la profession de chiropraticien et sa perception négative. Les opportunités spécifiques à la profession comprenaient la création d'une chaire ou d'un centre de recherche en chiropratique sportive et la mobilisation des chiropraticiens sportifs dans des réseaux de recherche en pratique et sur le terrain.

Conclusions: *Ces résultats peuvent éclairer les stratégies visant à promouvoir le développement des capacités de recherche dans le domaine de la chiropratique sportive et à élaborer des indicateurs spécifiques au contexte pour l'évaluation continue des capacités de recherche.*

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MOTS CLÉS : Capacité de recherche, sports, chiropratique, recherche qualitative

ers reported a preference for research to inform healthcare delivery within sport, such as conducting research on athletic injury, effects of interventions on athletic performance, and the care of athletes in clinical practice.⁴ These findings suggested the Canadian sports chiropractic field could benefit from a specialty-specific research strategy to advance its research capabilities.

As a next step, a two-part qualitative study that interviewed sports chiropractic researchers and leaders was conducted. Part one⁵ developed a list of research topics to inform a Delphi research prioritization study, and part two (reported in this manuscript) explored the investigative capacity of the sports chiropractic field. In part one, a total of 150 research priorities and six areas of research were identified.⁵ These priorities were entered into the Delphi method, which is an iterative survey consensus process. The first Canadian⁶ and International⁷ Delphi research prioritization studies were published for the sports chiropractic field using expert panels of sports chiropractic academics, leaders, and clinicians. For the Canadian Delphi study⁶, the top three research priorities were 1)

research on the effects of interventions on athletic outcomes, 2) research about sports healthcare teams, and 3) clinical research related to spinal manipulative and mobilization therapy. The three highest ranked conditions to research were low back pain, neck pain, and concussion. Collaborations with sports physicians and universities/colleges were rated as important research partnerships to pursue.⁶

While these two Delphi studies^{6,7} established research priorities, it is uncertain if the sports chiropractic field has the capacity to conduct research in these identified areas. To determine the feasibility of conducting research on specific topics, it is important to understand a field's research capacity (defined as "the ability to engage in, perform or carry out quality research"⁸) and productivity (which is the research output of a field of study, such as publications, grants, conference presentations, etc.⁹). To capture this data, a research capacity and productivity survey of members of the RCCSS(C) was conducted and a scoping review investigated the research productivity of the Canadian sports chiropractic field over a five-year period from January 2015 to January 2020.¹⁰

While the research capacity and productivity survey and scoping review provided quantitative data about the field's capabilities¹⁰, previous authors suggest research capacity development (RCD) is a complex topic that requires consideration of many factors that cannot be characterized by quantitative methods alone^{11,12}. Additionally, RCD operates within interconnected health research systems that often include interactions between various system levels that include individual researchers, investigative teams, and organizations that operate within health and social care structures.¹²⁻¹⁴ To provide a broader understanding of research capacity across these interconnected levels, the collection of both quantitative and qualitative data is recommended.^{11,12} This present manuscript reports on the second part of a qualitative study that interviewed sports chiropractic researchers and leaders to investigate the challenges and opportunities for RCD in the sports chiropractic field.

Methods

This manuscript reports on part two of a research project that utilized a qualitative description study to explore research priorities (part one) and investigative capacity (part two) in sports-focused chiropractic research. Part one of

this project, along with detailed reporting of the methodology contributing to both parts of this qualitative study, is reported in our previous published report.⁵ This manuscript outlines our general approach and reports unique methodological components for part two. We direct readers to the part one publication⁵ for details about the study design, eligibility criteria, participants, interview settings, and data collection procedures.

Study design

We conducted a cross-sectional qualitative description study using semi-structured interviews of sports-focused chiropractic researchers and focus group interviews of organizational leaders of sports chiropractic in Canada. Qualitative description is a study design applied in qualitative research when the aim is to acquire a rich description from participants about a phenomenon under study without the need to develop substantive theory or explanations from the data.^{15,16} It often utilizes purposive sampling to identify participants who possess the appropriate lived-experience for the phenomenon under study, semi-structured and/or focus group interviews for data collection, and qualitative content analysis to identify themes and categories of participant descriptions. Qualitative description is a relevant study design for those aiming to gain first-hand knowledge of professionals' experiences with a particular topic, and has been applied previously to explore participant descriptions about challenges, facilitators, and barriers.^{16,17} Considering the aim of this study (part two) was to explore sports chiropractic professionals' descriptions about the challenges and opportunities for RCD in the sports chiropractic field, this study design was chosen.

Participants and eligibility criteria

To be eligible as a participant for the semi-structured interview component of this study, participants had to be registered chiropractors or researchers who have either conducted, been a collaborator, or supervisor of sports-focused chiropractic research and who have also published at least one sports-focused research paper within the past 10 years. To be eligible for the focus group interview component of this study, participants had to be either a current board member of the RCCSS(C) or its Foundation. Purposive and snowball sampling were used to identify participants that met our selection criteria and who

would yield appropriate and useful information for the aim of this study.¹⁸ For further detail about the sampling approach utilized, we refer readers to the part one publication⁵ of this study.

Research team and reflexivity for Part Two

The interviews were conducted by two members of the research team (ADL - male, LD - female). At each interview, another member of the research team (MB - female or KS - female) attended (in person, virtually, or by telephone) to take notes. Qualitative coding and analysis were conducted by three members of the research team (ADL, LD, and AM – male). At the time of this study, ADL and LD were practicing chiropractors, fellows of the RCCSS(C) and full-time faculty members at the Canadian Memorial Chiropractic College. AM was a practicing chiropractor and a resident of the RCCSS(C). Note takers KS and MB were a practicing chiropractor and fourth year chiropractic student at the Canadian Memorial Chiropractic College, respectively.

Considering the sports chiropractic field is a relatively small field of study, pre-existing relationships within the field exist. At the time of data collection and analysis, ADL, LD, and AM were involved in committee work with the RCCSS(C) and ADL and LD were actively involved in the sports-focused chiropractic research field. As a result, they have previous relationships with some of the participants who were interviewed. To mitigate any bias that may have occurred during the interviews, the interviewers regularly met before each interview to reiterate the study's aim and purpose. During the qualitative analysis, ADL, LD and AM aimed to decrease their own bias by regularly meeting to reflect on their coding decisions in relation to the study's aim.

Setting and interviews

The semi-structured interviews were conducted in-person or remotely using the Skype Application (Skype Technologies, Microsoft, USA), dependent on the availability of the participants. Two separate focus group interviews of the organizational leaders of sports chiropractic in Canada were conducted in-person: one for the Board of Directors of the RCCSS(C) and another for the Board of Directors of the Foundation for the RCCSS(C). These focus group interviews were conducted in a meeting room at the location of the RCCSS(C) Annual Board

Meeting. Three members of the research team were present at both focus group interviews. The lead author (ADL) moderated the focus group while LD and MB took field notes. The interview guide was informed by our previous work that investigated the research needs and preferences of Canadian chiropractors practicing in sport,⁴ and was distributed to members of the Research and Education Committee of the RCCSS(C) for feedback related to the questions developed and their relevance to our research question. The same interview guide was used for both the focus group and semi-structured individual interviews. All participants were sent our interview guide,⁵ a minimum of two days in advance of their interview, to provide them with the opportunity to familiarize themselves with the questions and to allow them to consider potential responses. For further detail about the setting and interviews, we refer readers to the part one publication⁵ of this study.

Analysis for Part Two

A qualitative content analysis of the interview transcripts was conducted using an interpretivist perspective. The intention of an interpretivist approach is to describe and interpret, but not to develop a substantive theory. It is concerned with how people feel, respond and give meaning to their experiences.¹⁹ Since we did not seek to develop theory from the data or compare and contrast the viewpoints of the participants, the semi-structured interviews of the researchers and focus-group interviews of the leaders were given equal weight in our analysis. The unit of analysis were the interview transcripts from each participant.

Three members of the research team coded the transcripts for part two of this qualitative study (AL, LD, and AM) using an inductive content analysis for both manifest and latent content. The coders regularly met for peer debriefing to discuss and resolve any coding discrepancies. Similar codes were sorted and collapsed together to create categories. Themes were abstracted from the codes and categories generated from the data with guidance from previous research that investigated frameworks for RCD in allied health professions.^{8,12} An audit trail of the coding and reflexive process was recorded throughout the analysis. The qualitative analysis and reporting of the data was guided by the consolidated criteria for reporting qualitative research.²⁰

Research ethics approval

This study received approval by the Canadian Memorial Chiropractic College (CMCC) Research Ethics Board (#1708E01, approval date 09/14/2017) prior to commencement. All participants signed a written informed consent form before the start of each semi-structured or focus group interview.

Results

Participants

For the semi-structured interviews, 25 sports-focused chiropractic researchers were recruited (22 from purposive and 3 from snowball sampling) and 20 participated (80% participation rate). For the focus groups, all 12 individuals recruited participated fully in the study (100% participation rate). A total of 32 participants completed this study. The average interview durations for the semi-structured and focus group interviews were 56.87 and 52.55 minutes, respectively. All participants reviewed and returned their transcripts to the research team, and 12 participants made minor revisions to clarify statements made in their interviews with no significant changes to the content. No new codes emerged from the data by semi-structured interviews 19 and 20. It was determined further interviews were unlikely to generate any significant new codes and themes from the targeted population and recruitment was concluded.²¹

Our sample had a larger proportion of males (78%), and there was large variability in the average years of practice and number of publications of our participants, demonstrating that participants had varying levels of clinical and research experience, respectively. Most participants held faculty positions (72%), had affiliations with chiropractic academic institutions (66%), and maintained a clinical practice (78%). Nearly all participants were chiropractors (97%), and 59% had some form of sports specialization training. Of the participants, 29 (90%) reported having post-graduate research training (master's degree or higher). Reflective of our sampling strategy, our sample was comprised of 21 (66%) Canadians and 11 (34%) from other countries. We refer readers to Table 1 from our part one publication⁵ for further reporting of the demographic characteristics of our participants.

Major themes

Our qualitative analysis identified four major themes: 1)

affiliations and collaborations, 2) human resources, 3) financial resources and 4) operational resources. Each major theme was divided into subthemes organized by the challenges and opportunities to develop research capacity in sports-focused chiropractic research (Figure 1).

Affiliations and collaborations - challenges

The affiliations and collaborations theme emerged from the data to categorize codes related to facilitating, establishing, and maintaining research affiliations and collaborations. Participants voiced concern that research affiliations and collaborations within the sports chiropractic field were lacking. Several described profession-specific issues, such as being a small “insular” research group, the division within the profession, and the negative perception of the chiropractic field as current challenges to build research collaborations, as conveyed in the quotes below.

“You have to engage with many other professions, and many other researchers...the reason for that kind of thinking is you’ll never be funded by national funding agencies because you’re too insular, you’re too within yourself, and you’re not broad-based across the entire healthcare spectrum.” (Semi-structured Interview Participant 18 - SSP18)

“I think we have chiropractors [who] are all about building their own castles, and they’re not about building a city, and if you build your own castle you’re never going to build a city because you live in your castle and you think it’s perfect and you’re the king of the castle, and actually the whole city out there, no one realizes actually the person in the castle’s actually not bad and I think that’s the problem we’ve got as a profession.” (SSP18)

“...there is still a lot of anti-chiropractic sentiment and those are the stories that university people hear when they start to look into our profession.” (SSP18)

Participants recommended shifting the current approach to a more collaborative mindset and to seek research opportunities with others outside of the field, such as in academia, sports organizations, and other healthcare and scientific disciplines.

Affiliations and Collaborations		Human Resources	
CHALLENGES	OPPORTUNITIES	CHALLENGES	OPPORTUNITIES
Lack of Collaborations Profession-specific Issues <ul style="list-style-type: none"> • Siloed • Negative perception • Lack of knowledge of the profession 	Collaborative Action <ul style="list-style-type: none"> • Communication • Networking and Relationship building • Incentives for Collaboration Pursue Collaborations <ul style="list-style-type: none"> • Academic Institutions • Clinicians • Sports-community • Inter-disciplinary • Intra-professional 	Lack of: <ul style="list-style-type: none"> Researchers Supervisors/Mentors Support Staff Time to do Research Higher Degree Research (HDR) Training 	Researcher Development <ul style="list-style-type: none"> • Talent Identification • HDR pathway • Research requirements in sports chiropractic training Support Staff Protected Research Time Incentives
Financial Resources		Operational Resources	
CHALLENGES	OPPORTUNITIES	CHALLENGES	OPPORTUNITIES
Lack of Funding <ul style="list-style-type: none"> • Grants • Infrastructure • Conferences • Career Opportunities • Training 	Funding Actions <ul style="list-style-type: none"> • Align research agenda with funding agencies • Establish Research Fund/Foundation/Grants • Collaborate for funding Pursue Funding Options <ul style="list-style-type: none"> • Government, Industry • Membership fees • Private donors 	Lack of Access <ul style="list-style-type: none"> • Library/Research Databases • Physical resources • Research Ethics Board • Statistical support Uncoordinated Research Strategy	Research Agenda/Strategic Plan Research Chair/Centre Practice and Field-Based Research Network Dissemination Network

Figure 1.

Themes and subthemes of challenges (blue) and opportunities (grey) for research capacity development in the sports chiropractic field.

“...it needs to be more collaboration, it needs to be...research groups...where you have one chiropractor amongst...many other people, and so larger groups...more collaborative.” (SSP12)

Some respondents reported that since many chiropractic academic institutions are not integrated within publicly funded universities alongside other healthcare education programs, this siloed academic environment can decrease the opportunities for interprofessional collaboration.

“I’m at [major university]...I think [there are] 22 different professions that we teach, but of course not chiropractic...it’s very easy for medical doc-

tors, to nurses, to physiotherapists, occupational therapists, speech therapists to do a lot of research and work together because they are so used to being in one environment where they have been educated together.” (SSP16)

A lack of knowledge of the profession and its sports subspecialty was reported as a challenge to build research collaborations.

“The problem that I encountered...is no one knows what [chiropractic college] is, no one knows what a DC [Doctor of Chiropractic] is, and I apologize again, nobody knows what a sports fellowship is.” (SSP18)

Affiliations and collaborations – opportunities

Despite these challenges, participants described areas of opportunity within this theme. These were categorized into the subthemes, *collaborative action* and *collaborations to pursue*. Collaborative action was defined as activities conducted with the intent to foster and develop research affiliations and collaborations. These actions included networking, relationship building, communication, and incentivizing collaborations.

“I think we need to establish unofficial contacts with people that we have identified that we want to work with, the groups we want to work with...to come into bigger projects.” (SSP12)

“Go to conferences like the ACSM [American College of Sports Medicine] and just strike up conversations with people who are researchers at other institutions who might have similar interests to you...you’d be surprised how often those types of collaborative networks start to develop because of a conversation that you just had in passing with somebody at a conference.” (SSP4)

“...it means that you have to put in a bunch of time working on other people’s projects...the idea is that when you do that, then they help you along with yours.” (SSP13)

A strategy offered by some participants involved facilitating affiliations and collaborations through strategic funding to incentivize collaborations.

“What kind of money do we have in order to approach some other organizations? Maybe we can form some partnerships in that sense.” (SSP3)

“Whatever it takes to create that relationship. It’s probably going to cost a bunch of money. It probably would require you know, a donation.” (SSP13)

Working in a collaborative setting has its advantages as it facilitates the opportunity to share information, thoughts, and ideas between researchers. Participants recommended the field pursue a variety of collaborations to advance the research capabilities of sports chiropractors.

“The first thing I would do is try to find collaborations which goes outside chiropractic because I think this is the problem...why do we have to do sports chiropractic research and not sports research?” (SSP12)

“...it’s becoming more and more the way that research goes, it’s becoming more and more multi-disciplinary kind of approach to studying a particular problem or question.” (SSP4)

Participants described the importance and value of working with key groups, such as researchers from major universities and those from the medical profession.

“...major universities and medical practitioners, they have the resources, they have the money...they have the contacts, so being able to team up in these fields, would be the best for us.” (Focus Group 2 Participant 4 – FG2P4)

Other opportunities to build affiliations included working with those in the sports community and with practicing chiropractors working in sport.

“I think that if we can collaborate with the clubs, essentially the people who are looking after the athletes...that would automatically involve other members of the sports delivery team, so that will become a multidisciplinary or interdisciplinary process.” (SSP15)

“...any project you had in mind, you could quadruple the size of it by engaging field practitioners across the country...but we’ve gotta create that infrastructure.” (SSP1)

“Great field practitioners are not necessarily ever going to be researchers, but their knowledge base and their connections are what’s important.” (SSP8)

Building research teams within the profession was also reported as an important opportunity to pursue, especially with other specialities within the chiropractic profession.

“...we can definitely start by collaborating intra-professionally...like collaborating with our clinical specialists and radiology specialists and the other specialties in Canada.” (FG1P6)

Human resources - challenges

The human resources theme was defined as the research workforce of a field of study and includes both researchers and support staff. A challenge identified within this theme was an overall lack of researchers and the staff that support them, such as research mentors, assistants, and statisticians.

“To have the team to be able to support the research, whether it’s lab focused, whether it’s the statisticians, whether it’s the research assistants to help the accessibility.” (FG1P2)

“You need to have a role model, you need to have somebody who can actually help you and assist you.” (SSP12)

The lack of sports chiropractors with a PhD designation was identified as a key challenge to advance RCD for the field. Not only can those with PhD training conduct research, but they also play an important role in the ability to communicate and build relationships with other researchers and academic institutions.

“We really [have a] complete lack of PhDs in sport chiropractic.” (FG1P7)

“Without a PhD there is not common ground between the university sector and our profession... You really need to have a PhD in order to speak their language...to get the access and the credibility to the funding.” (SSP18).

“If some of our people had PhDs in nutrition, a PhD in sports psychology, a PhD in sport performance...that to me, at the very least, improves substantially the perception that chiropractors are experts in sports injury and sports-related issues.” (SSP18)

The lack of a facilitated pathway for sports chiroprac-

tors to obtain high degree research (HDR) training was another challenge reported. The sacrifices that clinicians need to make to obtain a HDR degree was described by some participants as daunting.

“I don’t know how easy it is to take somebody into a DC [Doctor of Chiropractic Training Program], and then now they’re a hundred grand in debt, and then go to grad school. I mean they could, but that structure needs to exist to make it more streamlined.” (SSP1)

“My trials and tribulations were that I was working full time and trying to go to school part time... as a consequence it took me longer than traditional grad students to get through both my Masters and my PhD basically...at the end of the day it was still stressful for me to like have that weight on my shoulders for literally years...I wish I could have maybe in some way, reduced my hours at work, but not lost my income.” (SSP5)

A challenge reported included a lack of protected time for clinicians to conduct research. Participants reported the sports chiropractic profession is typically comprised of clinicians whose interest is focused on clinical practice and not research. While clinicians may have an interest in conducting research, the benefits of this rarely outweighed the risks of taking time away from practice to earn an income and from personal/family life.

“I think we’re all desperately trying to work and treat patients in our clinics. We’re then going off and working in sports environments on top of what we’re doing already, and then we’ve got our family life.” (SSP15)

“Time is one thing because...if you are in practice and teaching and stuff, time to do that [research] is always short.” (SSP17)

Human resources - opportunities

Opportunities identified by participants to develop the human resources to support research included focusing on researcher development, access to support staff, protected research time, and incentives. To facilitate researcher de-

velopment, participants emphasized the need to identify research talent early, provide a pathway for HDR training for those with talent, and incorporate research requirements into sports chiropractic training programs.

“We really need to look out for those people who are interested in actually doing this kind of research full-time”. (FG1P6)

“We need to build an academic pathway to make sure chiropractors are doing research in universities...we need more DC, PhD.” (SSP19)

“...get the residents in some sort of cooperative program...where a person could get their fellowship and their MSc side by side...get them the skills that they need to be productive researchers.” (SSP7)

Participants discussed the importance of building a “pipeline” of research talent and providing a system of mentorship linking them with senior researchers.

“You need to have that kind of cycle, or that pipeline, and I’ve seen it work in several labs where the senior researcher has a group of PhDs, so post-docs, that work underneath them, then they [post-docs and PhD students] act almost as mentors to the master’s students. The master’s students act as almost mentors to the undergrads that are working in the labs. Often times, what ends up happening is those undergrads end up becoming master’s students and the master’s students become PhD students.” (SSP4)

Creating mechanisms to facilitate a pathway for those with research interest to obtain HDR skills and degrees was a strategy described by participants.

“Support them with some sort of fellowship to sort of give them the ability...to remain in practice, or work at [chiropractic academic institution]...go to school and still be a professional making some income.” (SSP5)

“...if we had our own internal research path-

ways...then there’s a natural flow of chiropractic through that research machine. The school is producing master’s and PhD students, that research agenda is inherent to the institution, their training is complimentary to it, and they’re automatically bringing some clinical knowledge to it, which a bachelor’s student does not.” (SSP1)

Having qualified researchers does not necessarily translate into producing research. To further advance research capacity, our participants discussed other opportunities to advance the human resources of the sports chiropractic field. In addition to developing researchers, staff that support the research effort should be developed, opportunities for providing clinician-researchers with protected time to conduct research should be explored, and incentives can be provided to motivate individuals to conduct research. Incentives that were discussed ranged from offering reduced membership renewal fees for those who conduct research to providing recognition and awards.

“I wish someone could say, ‘hey, [employer] that for the next whatever year, you’ll be at work from 8 to 1 then from 1 to 5 you, you have release time to do whatever’...but not lose my, my full-time income.” (SSP5)

“...for a research type thing, maybe there can be...a leeway in registration price if you’re helping out with a research project.” (SSP3)

Financial resources - challenges

The financial resources theme was applied to categorize codes related to funding the sports chiropractic research field. Financial resources were described as critical for supporting the capacity to conduct research.

“I think that acquiring funding is the biggest issue.” (SSP8)

A lack of funding in the form of research project grants was reported as a key challenge and understanding the funding lines to support sports-focused research for chiropractors was reported as a factor to advance the research potential for the sports chiropractic field.

“If we really want to make serious headway, serious progress, then we really have to look at the funding lines for sport chiropractic research. To date, we know that’s very low and that’s the reality of not seeing the significant type of research we want to have done being completed...getting the budgets for sports chiropractic research to happen are key.” (FGIP6)

Participants also discussed the limited funds available to support research infrastructure and the minimal financial support for attending research conferences important for networking.

“Feasibility and accessibility of equipment...just knowing who has what equipment and where, and how do you get the ability to use the equipment and at what fee. So, it comes back to money again.” (FGIP5)

“I have to fund my own research and I don’t have finances to travel...I can’t ask my wife to give up another holiday, another vacation this summer, because I’m going to the [research conference], so I’ve never gone.” (SSP9)

Lack of compensation for the time and effort required to conduct research can discourage researchers, especially clinician-researchers from further involvement in research. Interviewees voiced their frustration with the lack of compensation for their research efforts, and the limited research career opportunities available for clinician-researchers to have a funded partial research workload.

“The clinician-researcher, I think is super valuable, but it’s difficult to do it in a way that doesn’t cost the person performing that research money and stress, and cost to their family.” (SSP1)

“I’ve published five papers out of the goodness of my heart...I didn’t get a dime. In fact, I spent money on it.” (SSP1)

“...the goal I see for us, to improve in research is to have people who are well paid to do that.” (SSP14)

Financial resources – opportunities

While the lack of financial resources was described as a challenge, participants offered strategies to improve the financial resources of the research effort. These opportunities were categorized into two subthemes – *funding actions and pursue funding opportunities*. The experienced researchers interviewed recommended aligning the field’s research agenda with those of funding agencies to increase the likelihood of success for obtaining grants from these agencies.

“Pick the one or two institutes that are most closely aligned with sports chiropractic, look at their focus, look at the things they want to research, look at their language, adopt their language as part of your research perspectives and research agenda, so the likelihood of you getting funding dollars in a competitive process from the institute is good.” (SSP18)

“The funders, the deciders of who gets the money, they need to be convinced that you’re not just a special interest group of a dozen or so people sitting around a table saying well let’s research sports chiropractic. It has to be geared to, how do we advance the interests of Canadians...that’s kind of like an overall kind of perspective to have.” (SSP18)

To address the funding limitations discussed, participants emphasized the importance of having a foundation dedicated to raising money to fund the sports chiropractic research effort. It was suggested a foundation could offer research grants, fund PhD training opportunities, and invest in infrastructure. Having an active research foundation was thought to be a central strategy to address the field’s research funding challenges.

“You need a foundation that is actually active and raising funds...and has an arm that is distributing those [funds] to the active chiropractic researchers out there, and the funds that are getting distributed, they’ve got to be meaningful.” (SSP7)

“...being able to provide some grantsmanship type money for those interested individuals to move on

in their academic career, and then utilizing those people to come back and help support the sport chiropractic field from a research standpoint.” (FG1P7)

Another funding action that was emphasized was the importance of collaborating with experienced researchers/institutions to increase the likelihood of obtaining research funding.

“Collaborating with a university where you could get funding and just easier access to different equipment or things like that, might be just easier to conduct research.” (FG1P4)

“Finding and collaborating with those who are already within an area that has funding...or has a niche area where an institute is funded, and funding can come via the institute.” (SSP10)

As for the subtheme pursuing funding opportunities, participants provided suggestions for funding sources to pursue. These included government sources, industry, membership fees from sports chiropractic associations, and private donors. The high reward but difficulty with success at obtaining government research grants was discussed by an experienced research administrator (SSS18).

“...if you’re just going to go after a hundred dollars here and a hundred dollars there, then every year you’re just going to have a group of sports-related chiropractors sitting around a table discussing research and that maybe fine, but what are you going to do for thirty-five million [inhabitants of a country] who are in desperate need of sports chiropractic and don’t even know who you are?” (SSP18)

“one of the next steps for your group would be to compare your research perspectives and priorities to those of the provincial and national federal funding agencies, they’re the ones with the dollars, everyone is chasing them, although the success rates are very low, you have to get into the process...because that’s where the credibility is and

the big bucks are, without the big bucks you won’t go very far.” (SSP18)

The opportunities for establishing relationships with organizations and corporations of the sports industry was also recommended.

“...sports organizations that really like chiropractors...[we can] say, ‘ Hey! Why don’t you make a donation to our research fund, so that we can do more research to find ways to, you know, improve performance, decrease the probability of injuries, find ways to speed up the treatment that your chiropractor does.’” (SSP11)

Participants also recommended sports chiropractic associations dedicate a portion of their membership fees to help fund the sports chiropractic research effort.

“... those people who are joining or are members of the national sports chiropractic associations actually pay into a fund that can then pay for its own research.” (SSP15)

The importance of building long-term relationships with potential private donors was also described, especially building rapport with those with the capability of making meaningful contribution amounts.

“You need to develop relationships right across [country] with personal individuals who are willing to donate to meet your agenda, that’s why the words in your agenda are very important.” (SSP18)

Operational resources - challenges

Operational resources refers to the physical and non-physical resources that support the research effort, such as the research infrastructure and its supporting processes. The current challenges identified in this theme included a lack of access to physical resources in the form of research equipment and laboratories, and difficulty accessing supportive services, such as library access, research ethics boards, and statisticians.

“I feel like being a clinician in practice, now that I don’t have a connection to an institution, I have

no ability to do research because I don't have any access to databases.” (FG1P5)

“For somebody who's not affiliated with an institution and is interested in research, knowing that an REB [Research Ethics Board] can be accessed... for that [research] ethics piece.” (FG1P2)

Participants also described the limitations of the quality and type of research that the sports chiropractic field can conduct, due to the current capacity of its operational research resources. Specifically, some participants discussed the difficulty of conducting randomized clinical trials.

“You need some pretty good infrastructure to do a randomized controlled trial. You need to be able to pull the people into the study and get the numbers you need in the timeframe.” (SSP9)

Another identified challenge was an uncoordinated research strategy. Since the sports chiropractic field has limited resources with relatively few full-time researchers, participants voiced concern over the impact of an uncoordinated research strategy on such a small field of study. Participants emphasized the importance of having a coordinated plan to minimize wasting the limited research resources available.

“I think we have to be really clever and really collaborative about what we do and how we do it, because we've got so limited resources, and we've got so few people that can actually pull this off.” (SSP15)

Operational resources – opportunities

The opportunities to improve the operational research resources included developing a research agenda and strategic plan, creating a research chair or centre for the sports chiropractic field, establishing practice- and field-based research networks, and improving knowledge transfer by creating a dissemination network. In keeping with the concern about obtaining research funding and minimizing research waste, participants described the importance of creating a research agenda and strategic plan to inform

fundraising and to ensure research resources are responsibly allocated.

“Developing a research agenda is very important because that helps establish the plan.” (FG1P7)

“So, we're all clearly finding that the funds are key, but obviously we also need to have that plan in place. If we can put the plan in place that will help support the funds, I mean it's going to be hard to go after the funds without a plan.” (FG1P6)

An opportunity that participants believed was important to advance the sports chiropractic field, was to create a sports chiropractic research chair and research centre within a university setting. Participants described this as an excellent mechanism to fund a full-time researcher to implement the research agenda and provide the system to create a pipeline of researchers to develop graduate students.

“I think the first thing that you really need to establish is a chair or a centre, and preferable a chair in a centre...the centre for sports chiropractic research and it needs to be within an institution you know that has a research drive to it. Then somebody who is sitting in the chair that is really going to drive that bus.” (SSP7)

“Let's pick one of these provincial universities that has a good program in sports medicine...let's put in a new chair in sports chiropractic research, let's create fellowships that drive more people there.” (SSP11)

In addition to creating a research centre and/or chair, another opportunity discussed was to create a mechanism where researchers and field practitioners can collaborate in a structured way to bring “clinical practice closer to research”, and vice versa. The suggestion for doing so was to create practice- and field-based research networks. Participants believed this would be a mechanism to increase the involvement of clinicians in the research effort, contributing to increasing research capacity.

“...to allow your field practitioners to collect data at a competition level would be very valuable, but

also at a practice level, trying to get some practice-based research going, I think would actually really help with capacity issues.” (SSP7)

Participants stressed practice-based research cannot occur without researchers and clinicians working together, and often these two groups do not collaborate effectively without a formal structure in place to facilitate this valuable interaction.

“We seem to have our researchers over in one corner and our field practitioners over in the other corner. The researchers say, ‘gee it would be nice to get out and get some data from, you know, sporting events and what we do’, and the sports practitioners saying, ‘gee it would be nice to convert what I do into some research.’ And they are not talking. We need to be able to deliver a platform for field practitioners to translate their experience into research...we need to set up practice-based research networks at the “country” level and at the “international” level.” (SSP6)

Another opportunity to improve the operational resources of the sports chiropractic research effort, was to improve the dissemination of research to improve knowledge transfer, especially to clinicians who are not affiliated with an academic institution. Suggestions for improvement in this area included creating more formalized dissemination strategies for knowledge sharing.

“I think that people that are not in an institution have no idea what research is out there, what people are looking to do.” (FG1P5)

“The [research conference] serves as pretty much the touch point for almost all collaborative work within the chiropractic profession...there is probably a rationale for a separate body that would just look at sports research between all the chiropractic colleges.” (SSP13)

Discussion

To our knowledge, this is the first qualitative study investigating the research capacity of the sports chiropractic field. Our analysis identified four themes related to the

challenges and opportunities for RCD in sports chiropractic – 1) affiliations and collaborations, 2) human resources, 3) financial resources, and 4) operational resources. The main challenges for affiliations and collaborations, were a lack of research collaborations and the influence of profession-specific issues when building collaborations. Pursuing collaborations and collaborative actions, such as communication, networking, and relationship building, were key areas of opportunity. For human resources, challenges included a lack of researchers, support staff, time to conduct research, and limited sports chiropractors with HDR training. Opportunities for improvement were related to researcher development strategies, providing research support staff, facilitating protected time to conduct research, and providing research incentives. Regarding financial resources, a lack of funding was a key challenge, specifically related to grants, infrastructure, conferences, career opportunities, and training. Opportunities to advance financial research resources were related to funding actions and pursuing funding options. Key challenges for operational resources were a lack of access to research resources and not having a coordinated research strategy. Creating a research agenda/strategic plan, a research chair/centre, practice- and field-based research networks, and improving dissemination were opportunities identified in this area. These findings will inform an RCD strategy for the sports chiropractic field.

Advancing the research capacity of a health profession is important to address health challenges and support evidence-based care.^{1,2} While established health professions, such as medicine, have implemented and evaluated RCD strategies, many allied health professions are underdeveloped in this area. Recognizing this challenge, Matus *et al.*⁸ conducted a systematic review to develop a consolidated framework for RCD for the allied health professions. This framework consists of three major themes: 1) supporting clinicians in research, 2) working together, and 3) valuing research for excellence. To “support clinicians in research”, the framework emphasizes education and training, mentoring/coaching, access to resources, protected time and funding, reward and recognition, and support to undertake post-graduate HDR. To “work together” in research, areas of focus include collaborations and partnerships, shared purpose and drivers, team-based research projects, and shared expertise. Strategies for “valuing research for excellence” include providing visible support

for research, committing to research as core business, prioritizing research that is “close to practice”, and integrating local research findings back into practice. This consolidated framework provides a roadmap for RCD for allied health professions.

The results of our present study revealed the sports chiropractic field exhibits research capacity characteristics similar to the framework for RCD by Matus *et al.*⁸ In our study, the opportunities to support researcher development for the sports chiropractic field included research talent identification, creating HDR training pathways, providing research support staff, providing protected research time, and offering research incentives. Matus *et al.*⁸ identified similar strategies in their “supporting clinicians in research” theme, such as education and training, protected time and funding, reward and recognition, and support to undertake post-graduate study including HDR. Other similarities were discovered in our “affiliations and collaborations” theme that emphasized the importance of collaborative actions and pursuing collaborations. This is similar to the “working together” theme from Matus *et al.*⁸ Moreover, within their “valuing research for excellence” theme, Matus *et al.*⁸ described concepts, such as “prioritization of research that is close to/relevant to practice” and “integration of local research findings back into practice”. In our study, participants recommended the creation of practice- and field-based research networks. An essential purpose of practice-based research networks is to conduct research that is close to or relevant to practice and to disseminate the research findings back to the practices that conducted the research to close the knowledge to practice gap.^{22–24} The similarities between our findings and the consolidated framework by Matus *et al.*⁸, provides initial evidence that the sports chiropractic field exhibits similar research capacity features as other allied health professions.

While understanding RCD within the setting of a health profession is valuable, developing research capacity to optimize research impact requires consideration of RCD in a broader context. It involves applying RCD across interrelated components of a health research system, coordinating RCD amongst researchers, research institutions, stakeholders, and health and social care systems. To develop such guidance, Cooke^{11–13,25} conducted RCD investigations within a publicly funded collaborative applied health research partnership to develop an evi-

dence-based Framework for Research Capacity Development for Impact (RCDi)¹³. This framework was designed to inform RCD in people, organizations, and the wider health research system to plan, develop, and execute impactful research.¹³ It is comprised of structural levels (the individuals, organizations, and health & social care systems in which research development activity occurs) and six capacity building principles that “cut across” these structural levels (skills and confidence building, co-production, actionable dissemination, infrastructure, linkages and collaborations, sustainability and leadership, and ownership and responsibilities).¹³ Interpreting our study’s findings within this framework, our “affiliations and collaborations” theme included elements consistent with Cooke’s “linkages and collaborations” principle.¹³ Our “operational resources” theme identified parallels with Cooke’s “infrastructure” principle,¹³ and our “researcher development” subtheme aligned with Cooke’s “skills & confidence building” principle.¹³ The recommendation to create a research chair and centre aligns with Cooke’s “sustainability and leadership” principle¹³, and the recommendation to create practice- and field-based research networks and a dissemination network is consistent with Cooke’s “actionable dissemination” principle.¹³

As described by various authors^{12–14}, RCD is complex and operates at various structural levels ranging from individuals, teams, organizations, and the overall health system. Our analysis revealed that many of our themes and subthemes also cut across structural levels of a research system. For example, individuals with research talent must be identified and mentored by researchers and research teams (individuals and teams), funding bodies (organizations) must provide the finances to facilitate post-graduate training pathways for aspiring researchers (individuals), academic institutions or healthcare organizations (organizations) must provide career opportunities for those who obtain such skills (individuals), and granting opportunities for researchers (individuals and teams) should be available to conduct research to influence policy (sports and healthcare systems). Since many of our findings are in line with the frameworks by Cooke^{12,13} and Matus *et al.*⁸, our results can be utilized alongside these frameworks to inform an RCD strategy for the sports chiropractic field.

While our results provide preliminary evidence the sports chiropractic field exhibits similar challenges and

opportunities for RCD as other health professions, we did identify findings unique to the sports chiropractic context. Many participants cited profession-specific issues, such as the negative perception of the chiropractic profession and the profession's own internal divisiveness as challenges to build research affiliations and collaborations. The tendency of the chiropractic profession to be perceived as being "siloe" and the lack of knowledge of the profession were expressed as challenges affecting collaborative activity. Our previous research capacity survey¹⁰ found only 18% of active sports chiropractic researchers were involved in a collaboration outside of their academic institution. Despite these limited research collaborations, many participants in this present study emphasized the importance of building collaborations to advance research capacity. This finding is consistent with a Canadian sports chiropractic research prioritization Delphi study, where the top six research priorities in the first Delphi round were related to building research collaborations.⁶

Other findings unique to the sports chiropractic field centered around human research resources. A consistent challenge emphasized by participants was a lack of full-time researchers and those with PhD qualifications. This finding is supported by our sports chiropractic research capacity survey that found only 1.8% of its survey participants reported having a PhD degree, with a similar amount being full-time researchers.¹⁰ Our interviewees in this present study emphasized the importance of supporting clinician-researchers. They cited a lack of protected time to conduct research, and the difficulty clinicians have in obtaining HDR training due to the competing priorities of clinical practice, time, and personal responsibilities. These findings are in line with our previous work that found the Canadian sports chiropractic research effort is primarily conducted by part-time clinician researchers, whose research training is primarily obtained through sports chiropractic fellowships (69%) with some obtained from master's degree programs (24%).¹⁰ Strategies are required to develop PhD qualifications amongst sports chiropractors and support them with full-time research opportunities.

Strengths, limitations and future research

A strength of our study was the use of semi-structured and focus groups interviews to investigate research capacity. This provided the opportunity to study the complexity of

research capacity that cannot be fully explored with quantitative methods alone. Another strength was our diverse sample of participants that included a mix of interviewees of various ages, experiences, academic roles, and geographical regions. Despite obtaining a sample of participants that conducted sports-focused research, our study did not investigate the perspectives of stakeholders of the sports chiropractic field, which can be a focus of future research. Another limitation is our study did not directly investigate research culture. Validated instruments have been developed to assess research culture amongst individuals, teams, and organizations. Future investigations can apply these tools to study the research culture of the Canadian sports chiropractic field. Additionally, recent literature has recommended the identification and development of indicators to study the process of RCD operating in a research system.^{11,12} In this study, we identified themes and subthemes specific to RCD for the sports chiropractic field, but did not investigate their prevalence or prioritization. Future work can utilize these themes to develop field-specific RCD indicators and interventions. Mixed methods and consensus procedures can be applied to investigate and prioritize these items to inform their incorporation into an overall research strategy, and quantitative studies can provide outcome data on their effectiveness.

Conclusion

As part of the "Advancing the Research Effort for Canadian Sports Chiropractors Initiative", this study provides specific and detailed insight about the challenges and opportunities for RCD for the Canadian sports chiropractic field. To advance research capacity, our qualitative data supports increasing fundraising efforts to secure sustainable funding, expanding research affiliations/partnerships through collaborative actions, creating HDR training pathways for clinician-researchers, enabling research activity by providing support staff and research time, aligning the research agenda with funder/stakeholder priorities, establishing a research chair/centre, and formalizing partnerships between clinicians and researchers through practice-based research networks. Additionally, our findings indicate the sports chiropractic field exhibits similar RCD features outlined in RCD frameworks for allied health professions.^{8,12,13} Given this alignment, these RCD frameworks^{8,12,13} can be applied to the Canadian sports chiropractic field within the context of the RCD

data obtained from this current study, along with research development data obtained from other studies^{4-6,10} of the “Advancing the Research Effort for Canadian Sports Chiropractors Initiative”. Integrating these data sources to inform research strategy development, will increase the potential for Canadian sports chiropractors to make meaningful contributions as research partners in society.

References

1. National Health Service England. Maximising the benefits of research: guidance for integrated care systems. NHS England. March 13, 2023. 1-17. Report No: PR1662. Available from: <https://www.england.nhs.uk/long-read/maximising-the-benefits-of-research/>
2. Boaz A, Hanney S, Jones T, Soper B. Does the engagement of clinicians and organisations in research improve healthcare performance: a three-stage review. *BMJ Open*. 2015;5: 1-14.
3. Chalmers S, Hill J, Connell L, *et al*. The value of allied health professional research engagement on healthcare performance: a systematic review. *BMC Health Serv Res*. 2023;23: 1-19.
4. Lee AD, Szabo K, McDowell K, Granger S. Opinions of sports clinical practice chiropractors, with sports specialty training and those without, about chiropractic research priorities in sports health care: a centering resonance analysis. *J Can Chiropr Assoc*. 2016;60(4): 342–369.
5. Lee A, deGraauw L, Muir B, *et al*. A qualitative study investigating research priorities and investigative capacity in sports-focused chiropractic research, part 1 - identifying research priorities to inform a Delphi study. *J Can Chiropr Assoc*. 2021;65(3): 292–317.
6. Lee A, DeGraauw L, Muir B, *et al*. Identifying and prioritizing research to inform a research agenda for Canadian chiropractors working in sport – the Canadian sports chiropractic perspective. *J Can Chiropr Assoc*. 2022;66(3): 227–243.
7. Belchos M, Lee AD, De Luca K, *et al*. Identifying sports chiropractic global research priorities: an international Delphi study of sports chiropractors. *BMJ Open Sport Exerc Med*. 2023;9(4).
8. Matus J, Walker A, Mickan S. Research capacity building frameworks for allied health professionals - a systematic review. *BMC Health Serv Res*. 2018;18(716): 1-11.
9. Abramo G, D’Angelo C. How do you define and measure research productivity? *Scientometrics*. 2014;101(2):1129–44.
10. Lee A, Muir BJ, Oh D, *et al*. Investigating the research capacity and productivity of Canadian sports chiropractors. *J Can Chiropr Assoc*. 2023;67(3): 202-225.
11. Sarre G, Cooke J. Developing indicators for measuring Research Capacity Development in primary care organizations: a consensus approach using a nominal group technique correspondence. *Health Soc Care Community*. 2009;17(3): 244–253.
12. Cooke J. A framework to evaluate research capacity building in health care. *BMC Fam Pract*. 2005;6(44): 1–11.
13. Cooke J. Building research capacity for impact in applied health services research partnerships comment on “experience of health leadership in partnering with university-based researchers in Canada – a call to ‘re-imagine’ research.” *Int J Health Policy Manag*. 2021;10(2): 93–97.
14. Holden L, Pager S, Golenko X, Ware RS. Validation of the research capacity and culture (RCC) tool: measuring RCC at individual, team and organisation levels. *Aust J Prim Health*. 2012;18(1): 62–67.
15. Ghorbani A, Matourypour P. Comparison of interpretive description and qualitative description in the nursing scope. *Rev Bras Enferm*. 2020;73(1): 1-2.
16. Kim H, Sefcik JS, Bradway C. Characteristics of qualitative descriptive studies: a systematic review. *Res Nurs Health*. 2017;40(1):23–42.
17. Neergaard MA, Olesen F, Andersen RS, Sondergaard J. Qualitative description-the poor cousin of health research? *BMC Med Res Methodol*. 2009;9(1): 1–5.
18. Campbell S, Greenwood M, Prior S, *et al*. Purposive sampling: complex or simple? Research case examples. *J Res Nurs*. 2020;25(8): 652–661.
19. Verhoef M, Mulkins A, Boon H. Integrative health care: how can we determine whether patients benefit? *J Altern Complement Med*. 2005;11(suppl 1): S57–65.
20. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6): 349–357.
21. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Family Health Intl*. 2006;18(1): 59–82.
22. Westfall J, Mold J, Fagnan L. Practice-based research-“Blue Highways” on the NIH Roadmap. *JAMA*. 2007;297(4): 403–406.
23. Bussieres A, Cote P, French S, *et al*. Creating a chiropractic practice-based research network (PBRN): enhancing the management of musculoskeletal care. *J Can Chiropr Assoc*. 2014;58(1): 8–15.
24. Sauers E, Mcleod T, Bay R. Practice-based research networks, part I: clinical laboratories to generate and translate research findings into effective patient care. *J Athl Train*. 2012;47(5): 549–556.
25. Harris J, Grafton K, Cooke J. Developing a consolidated research framework for clinical allied health professionals practising in the UK. *BMC Health Serv Res*. 2020;20(852):1–15.