

Research resource environment in Canada. Gathering knowledge in advance to inform chiropractic research priorities

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Objective: *To better understand the research resources and environment within the Canadian chiropractic profession.*

Methods: *All members of the Canadian Chiropractic Association ($n=7200$) were invited to access an electronic survey on research capacity, activity, and resources. Canadian chiropractic stakeholder organizations received an invitation to participate in a related survey.*

Results: *505 CCA members completed the survey (7.0% completed response rate, 65% males, 19% with graduate degrees). Researchers (26 full-time and 67 part-time) produced over 530 authorships in the past*

Objectif : *Mieux connaître les ressources et les conditions de recherche dans le domaine canadien de la chiropratique.*

Méthodologie : *Tous les membres de l'Association Chiropratique Canadienne ($n = 7\,200$) ont été invités à accéder à un sondage en ligne sur la capacité, les activités et les ressources de recherche. Les associations canadiennes de chiropratique concernées ont reçu une invitation à participer à un sondage apparenté.*

Résultats : *505 membres de la CCA ont répondu au sondage (taux de réponse de 7 %, 65 % des répondants étaient des hommes, 19 % étaient diplômés). Au cours des cinq dernières années, les chercheurs (26 à plein*

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five years. Clinical research and systematic reviews were the most common areas of involvement. Regular meetings were rarely reported between researchers and chiropractic stakeholder organizations. Stakeholders indicated using research for member education, negotiation with government or funders, direct inquiries, and increased credibility. Fewer than half of the organizations regularly evaluated their research needs.

Conclusions: Chiropractic research resources in Canada are growing, but inconsistent communication and coordination between researchers and knowledge users persists.

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KEY WORDS: chiropractic, research, capacity, resources

Introduction

Setting research priorities is an activity that the chiropractic profession first undertook in 1996. The first Research and Agenda Conference (RAC) was held in Washington DC, funded in large part by the US Department of Health and Human Services.¹ Since then, an American-based RAC has been held annually with each meeting producing and refining outputs related to various research priorities.¹ Soon, other countries began to create similar conferences with similar outputs. The Canadian chiropractic profession developed their first research agenda in 2000², followed by the Europeans in 2013³, and the Australians who created a specific practice-based research program in 2014 with the mandate to develop a coordinated research agenda and increase research capacity⁴.

As can be expected, the sophistication of these efforts have increased as have their resulting recommendations. Still, several omissions in these collective processes stand out in today's healthcare environment. Specifically, very few of the resulting research agendas, if any, include the voice of the patient. While generating a research agenda requires input from those who perform and administrate

temps et 67 à temps partiel) ont publié plus 530 articles. La recherche clinique et les examens systématiques étaient les activités suscitant le plus d'intérêt. Des rencontres régulières entre chercheurs et associations de chiropratique concernées ont été rarement signalées. Les intervenants ont indiqué qu'ils effectuaient des recherches pour informer les membres, négocier avec le gouvernement ou des bailleurs de fonds, présenter des demandes de renseignements et accroître leur crédibilité. Moins de la moitié des associations évaluaient régulièrement leurs besoins de recherche.

Conclusions : Il existe de plus en plus de ressources de recherche en chiropratique au Canada. Mais on observe toujours un manque de cohérence dans la communication et la coordination des efforts entre les chercheurs et les utilisateurs des connaissances.

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MOTS CLÉS : chiropratique, recherche, capacité, ressources

research, in this age of patient-centered care, it should also be a requirement that future research agendas include the opinions of the public who stand to benefit from chiropractic care.⁵

Another potential omission in research agenda creation is ignoring available research resources. This missing step in setting a research agenda is a critical one in terms of generating impactful research priorities; even the top research priorities may be irrelevant if the resources are not available for their execution. Although establishing a list of research infrastructure was attempted at RAC in 1997⁶, we are unaware of any research agenda to date that has been able to frame its stated priorities in terms of available resources, infrastructure or otherwise. As such, having information about available research resources in areas such as available personnel, academic expertise, appropriate infrastructure, held funding, and sufficient time allows research priorities to be put into perspective in terms of the probability of completion within a specific timeframe. In this way, by first taking stock of research capacity and resources before setting research priorities, we can better define which research priorities can be ac-

complished most readily. Similarly, those research priorities with relatively fewer available resources can be downgraded or earmarked for when resources become available. Thus, the objective of the current project was to better understand available research resources and their utilization within the Canadian chiropractic profession.

Methods

Survey Content

The project consisted of two surveys designed for practitioners and stakeholders. The practitioner survey was partly adapted from a prior research capacity survey^{7,8} with the addition of new questions to better ascertain research resources. This survey included 33 questions covering four themes: human resources ($n = 16$), research output ($n = 13$), research communication ($n = 2$) and research resources ($n = 5$). Doctors of Chiropractic (DCs) who responded that they were neither part-time or full-time researchers only completed questions related to human resources. The stakeholder survey included 14 questions covering three themes: human resources ($n = 3$), stakeholder needs/use of research ($n = 8$), and research communication ($n = 3$).

Data Collection

Survey materials were provided to practitioners and stakeholders over a 12-month period between June 2014 and May 2015 and administered electronically using SurveyMonkey. The practitioner survey was provided to all DCs in Canada who had internet access, a valid email address, and were members of the Canadian Chiropractic Association (CCA). Specifically, the CCA and all ten provincial chiropractic associations provided email-forwarding services through their respective membership lists, resulting in a pool of 7,200 DCs. Those interested in participating in the survey were respectively invited to follow a link to complete the online survey questionnaire in either French or English. There, they could obtain detailed information about the study procedures. The content of the initial email, and two subsequent follow-up emails, described a unique opportunity to participate in an online survey related to research activities. To encourage honest and transparent responses, anonymity was assured by assigning a unique identification number to each registered DC with the master list withheld from

the investigators by the CCA. For those taking the survey, electronic consent was a prerequisite to accessing the survey content.

Similarly, a survey was emailed to stakeholder organizations ($n = 26$) to understand their contribution to Canadian research resources. These organizations included the CCA, all provincial chiropractic organizations (8 regulatory boards and ten professional associations) and other related stakeholder organizations (e.g. Canadian chiropractic colleges, and select external stakeholders and funding bodies).

Data Analysis

The resulting survey responses were imported into an Excel spreadsheet and analyzed descriptively. Each of the authors individually reviewed responses from each survey and arranged some items into themes in an ad hoc manner which were agreed upon by consensus.

Ethics

Ethical approval was obtained through the Canadian Memorial Chiropractic College institutional review board in September 2016 (Protocol 1609X04).

Results

Researcher Survey

Human Resources

From 542 returned questionnaires (a response rate of 7.5% or 542/7200), 505 participants agreed to have their information included in the analysis and 93 self-identified as researchers (26 full-time and 67 part-time) with 65.4% being male between the ages of 20 to 65 years. Of those, 84 reported having (or completing) a Master's degree, and 18 having (or completing) a PhD. Among researchers, 14 had some level of appointment at a chiropractic college with 11 having some appointment at a university.

Research Outputs

The 93 full-time and part-time researchers reported being currently involved in some form of ongoing research. Of these, a total of 530 authorships were published over the previous five years by the full- and part-time researchers. Researchers obtained funding through federal (4), provincial (8) and university (7) sources. Eleven researcher re-

spondents reported having trainees supported by federal, provincial or institutional funding.

Research Communication

Thirty-eight full-time and part-time researchers reported some form of outreach toward practitioners which included lectures, workshops, committee work, and social media. In contrast, only nine researchers reported having regular research meetings with chiropractic organizations.

Research Resources

The research approach used by 40 responding researchers could be divided into the following categories: epidemiology ($n = 10$ researchers), clinical studies ($n = 16$), basic science ($n = 7$) and health services ($n = 7$), with specific interests listed in Table 1. Fifty-three (53) researchers chose not to answer this question.

Active research collaborations were described in several ways, including: individuals with whom researchers collaborate ($n = 19$), professions ($n = 1$), various facilities or independent groups ($n = 10$), chiropractic colleges

($n = 4$), and universities ($n = 14$). Facilities described included office space ($n = 28$) and laboratory space ($n = 10$) with laboratory equipment falling into the following categories: motion capture/kinematics/kinetics (e.g. camera, force platforms), imaging (e.g. various ionizing and non-ionizing), robotics, virtual reality, physiology (e.g. physiologic recording, stimulation), spine biomechanics (e.g. stiffness, range of motion) and wet labs for biochemistry/cellular/molecular/microbial investigations.

Stakeholder Survey

A total of 20 respondents completed the stakeholder survey. Representatives from nine out of 18 provincial organizations (i.e., having a regulatory or professional association function) representing eight provinces responded to the survey. Further, representatives from all seven national organizations completed the survey including the Canadian Chiropractic Association, the Canadian Federation of Chiropractic Regulatory and Educational Accrediting Boards, the Canadian Chiropractic Examining Board, Canadian Memorial Chiropractic College, Canadian Chiropractic Protective Association, Fondation Chiropratique du Québec and Bone and Joint Canada. Their responses were sorted into one of two themes: *Need/use of research* and *Research communication*.

Need/Use of Research

Thirteen of the stakeholder respondents (4 national, 9 provincial) reported needing and/or using research to educate members of the public, government, and insurance industries and to negotiate with those groups. Research outputs such as clinical practice guidelines and scientific articles related to safety were said to be important and used toward improving clinical practice for members while research activities in general were seen to increase credibility of the profession. Stakeholders often sought out research to answer direct inquiries by others.

Research Communication

Several stakeholders indicated that their interactions with their members about research occurred through encouraging best practices or use of guidelines and evidence-based approaches. Stakeholders tended to disseminate research findings through reports, newsletters, and electronic services. Most admitted to having limited interactions with researchers themselves. Two reported

Table 1.
Self reported chiropractic researchers in Canada declared they are currently researching the following areas (n=93)

Systematic reviews	57
Neck and back pain	20
Sports injuries and biomechanics	9
Knowledge Translation	4
Accident-related injuries	5
Drug use and prescription	7
Concussions	4
Geriatric injuries and care	4
Kinematics and mechanisms	5
Workplace-related injuries	3
Mental health and psychological wellbeing	5
Osteoporosis	3
Epidemiology	4
Chest pain	4
Other	40

no interaction with researchers while 11 reported infrequently having meetings. Regarding the development of research needs or priorities for their organizations, 6 of the 20 respondents indicated that these had been defined, 8 did not have defined research needs or priorities, and 6 chose not to answer.

Discussion

In addition to the research resources of equipment and facilities, human resources through increased research capacity are important aspects of research resources available in Canada. In this respect, Canada is doing relatively well having established a number of research chairs in the past two decades⁷ who are now generating knowledge and creating opportunities for further training of high quality personnel. Compared to other countries with similar numbers of researchers, Canada's human resources are distributed across the country with a concentration in the Greater Toronto Area. While physical proximity may be desirable in some circumstances, having a research presence at several institutions across the country also has significant advantages including the ability to increase institutional collaborations and potentially access provincial or regional funding opportunities. Still, the total percentage of chiropractic researchers in Canada remains below other health care professions.⁹ For example, Ley and Rosenberg reported that in 2003, 1.8% of American medical doctors were engaged in research⁹, compared with 1.3% of chiropractors in Canada based on the results of our survey.

Our findings suggest that the overall research output is modest despite the recent increase in research capacity, partly reflecting the smaller population in Canada when compared with larger countries such as the United States, and the fact that many of the Canadian researchers are presently young investigators. Still, Canadian research productivity to date provides a measure of the success of the research chair program and those from our two chiropractic educational institutions. Due to the anonymous nature of the survey we were unable to link specific researchers with their responses and cannot identify the productivity of specific institutions or research groups.

Researchers affiliations' included universities, chiropractic educational institutions, and those working independently without an institutional affiliation. Such diverse settings likely influence the types of research be-

ing conducted in Canada, which is broad in nature and with good representation in several different investigative approaches (epidemiological, clinical, basic sciences, health services). However, many of the 530 publications involved lower quality designs such as case studies, editorials, and commentaries ($n = 133$), somewhat inflating the number of publications that may have otherwise been considered more impactful and of greater quality research design. Of interest, there were a significant number of research collaborations of various types, such as the University of Ontario Institute of Technology (UOIT)-CMCC Centre for Disability Prevention and Rehabilitation, and the McMaster University Chiropractic Working Group, expanding available resources significantly. Access to places to conduct research and the equipment needed to perform research were well represented.

While building a productive base is a shared goal for all stakeholders, communication between stakeholders regarding research-related topics does not occur regularly. Indeed, while there is an emphasis on knowledge translation between stakeholders and researchers, the majority of communication between the two remains traditional in the form of researchers presenting at conferences and publishing manuscripts. It can be noted that efforts at improved communication are underway with research translation activities scheduled for the semi-annual national convention and other clinician-based gatherings in Canada.

Stakeholders had very concrete ideas of how they use research, but were generally not proactive in determining their research needs nor meeting regularly with the research community. Regardless of the distribution of resources and personnel, a commonly noted issue is inconsistent or frequently absence of communication between researchers and stakeholders at both local and national levels.

Limitations

Unfortunately, our overall completed response rate was quite low (7.0%) despite our efforts to reach chiropractors on several occasions using the CCA and provincial organization member lists. In addition, some chiropractic researchers in Canada may not be members of the CCA and thus would not have the opportunity to participate in the survey. Inconsistency in distribution methods and timing between provincial and national distributing bodies may

have contributed to the limited response. However, given that our number of respondents was somewhat similar to previous research (684 responses in 2009 versus 542 in the present study)⁷, our results are likely comparable.

Future Work

At this time, a project is underway to set a research agenda in chiropractic in Canada.¹⁰ Results presented in this paper will assist this effort toward setting realistic research priorities. Furthermore it is important to establish ongoing communications between researchers, stakeholders and the public who benefits from chiropractic care. The Canadian Chiropractic Guideline Initiative has recently hired two Knowledge Brokers to help facilitate this process.¹¹ We also recommend better utilization of electronic databases such as the International Chiropractic Research Network (ICRN) which can provide an ongoing list of what research is being conducted by whom in Canada (and beyond) (<http://www.wfcinternationalchiropracticresearchnetwork.com>). As this survey was designed to provide an initial glimpse into available research resources in Canada, future attempts to quantify research resources in Canada should consider creating a more granular survey to explore this topic in greater detail and include more specific questions about available resources. Future studies should also include input from the general public, particularly chiropractic patients.

Conclusion

Understanding the research resource environment in Canada is critical in setting future research goals that can be achieved successfully. Canada is often perceived as a leader in chiropractic research. While chiropractic research capacity and resources in Canada are growing, our data suggest that communication about research between stakeholders is not keeping pace.

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