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ORIGINAL ARTICLE

Enablers and barriers to the development of interprofessional collaboration between physicians and osteopaths: A mixed methods study

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ABSTRACT

Osteopathy is a complementary and alternative medicine (CAM) that is growing in popularity. Increasing numbers of parents are seeking pediatric osteopathic care in addition to conventional medical care. Information about the development of interprofessional collaboration (IPC) between these practitioners is scarce. This explanatory sequential mixed methods study aimed to explore enablers of and barriers to the development of IPC between physicians and osteopaths involved with pediatric patients in primary care in Quebec, Canada. Postal questionnaires about collaborative practices were first sent to all physicians and osteopaths working with pediatric patients in Quebec. Semi-structured individual interviews were then conducted with a subset of 10 physicians and 11 osteopaths. A total of 274 physicians (14%) and 297 osteopaths (42%) completed the survey. Forty-five percent (n = 122) of physicians reported that they referred at least one pediatric patient per month to an osteopath. Thirty-six percent (n = 96) of physicians and 41% (n = 122) of osteopaths indicated having professional relationships. Personal consultation, professional relationship, perceived utility of osteopathy and community practice were positively associated with osteopathic referrals. According to participants, the strongest enabler of the development of collaboration was positive clinical results reported by parents. Additional enablers included the osteopath having previous health professionals training such as physiotherapist, pediatric experience, mutual respect for professional boundaries and complementarity, perceived safety of osteopathy, and parents' requests for collaboration. Barriers were the absence of a common language, the organizational and legal context, uncertainty regarding one another's roles, lack of interprofessional interactions, and limited scientific evidence. These results related to enablers of and barriers to collaboration between physicians and osteopaths and the illustration of their dynamic interaction could be used to guide efforts to promote productive collaboration and safe patient-oriented care.

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Introduction

Interprofessional collaboration (IPC) in health systems has been widely discussed in recent years. According to the World Health Organization (WHO, 2010a), collaborative practices optimize health services, strengthen health systems, and improve health outcomes and patient safety. Concepts related to collaboration commonly define it as a complex, voluntary, dynamic (D'Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005) and multidimensional process (Careau et al., 2014) achieved when multiple health workers from different professional backgrounds work together with patients, families, and communities to deliver the highest quality care (WHO, 2010a). However, collaborative practice in a routine clinical context is often a challenge, including between physicians and complementary and alternative (CAM) practitioners (Chung, Ma, Hong, & Griffiths, 2012; Fournier & Reeves, 2012; Ning, 2013). In this context, differences in paradigms, knowledge and language are often factors limiting collaboration (e.g. Hollenberg & Bourgeault, 2011; Keshet, Ben-Arye, & Schiff, 2013).

Background

Osteopathy is a CAM that is growing in popularity in Canada (Esmail, 2017), especially in Quebec for pediatric patients (Jean & Cyr, 2007) where more than 10% of daily osteopathic consultations are for patients aged 14 and younger (Morin & Aubin, 2014). This hands-on approach allows osteopaths to assess and intervene in the presence of functional disorders (WHO, 2010b) that frequently require an interprofessional approach (Kluba et al., 2014; Williams, Wilkinson, Stott, & Menkes, 2008). Osteopathy might play a role in reducing health costs (Cerritelli et al., 2013) and contributing to health care for functional disorders such as cranial asymmetry (Philippi et al., 2006), recurrent otitis media (Hachem & Halimi, 2012; Mills, Henley, Barnes, Carreiro, & Degenhardt, 2003), digestive (Tarsuslu, Bol, Simşek, Toylan, & Cam, 2009) and musculoskeletal problems (Herzhaft-Le Roy, Xhignesse, & Gaboury, 2017).

Canadian osteopaths work almost exclusively in private practice and no official referral system exists between them

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and other health professionals including physicians. Parents can consult an osteopath as a primary care practitioner without a referral. Although some studies have documented enablers of and barriers to the development of IPC between conventional medicine and CAM practitioners in integrative health care clinics (Chung et al., 2012; Gray & Orrock, 2014), none has specifically studied collaborative practices between osteopaths and physicians in the context of private practice.

The chiropractor-physician model of collaborative practice (Mior, Barnsley, Boon, Ashbury, & Haig, 2010) refers to collaboration between health professionals who, in the absence of formal structures and processes, work together while maintaining their autonomy. This description also fits the situation of osteopaths in Quebec. Mior's model emphasizes patient care and enablers which foster a trusting relationship and collaboration between chiropractors and physicians in a primary care community setting (Mior et al., 2010). The three broad categories of factors enabling the development of collaboration in this model are: 1) communication activities, 2) practice parameters, and 3) service delivery. Communication activities include both formal and informal encounters to inform, educate, share, and develop interpersonal relationships that foster the development of respect and mutual trust. This category also includes the preferred communication method for the exchange of patient-related clinical information. Practice parameters refer to the scope of practice, practice based on best evidence, and the use and development of practice guidelines. Finally, the service delivery category includes access, cost, reimbursement and responsibility for care. Trust (which is influenced by lack of knowledge, and actual or perceived negative experiences) and patient-centeredness (including patient participation in decision-making and professionals' respect for patient choices) are the ultimate goals of the model.

Evidence about specific enablers of and barriers to the development of IPC between physicians and osteopaths is essential to identify effective collaborative practices and optimize the safe integration of osteopathic interventions. This study aimed to explore enablers of and barriers to the development of IPC between physicians and osteopaths involved with pediatric patients in primary care in Quebec.

Methods

This study used an explanatory sequential mixed methods design comprising two phases (Quan–Qual) (Creswell, 2014). Since data about IPC between physicians and osteopaths are scarce, the quantitative phase (postal questionnaires) aimed first to determine the presence and frequency of certain characteristics that enable IPC. In the subsequent qualitative phase, semi-structured individual interviews explored, in depth, the significance of enablers and barriers to the development of this IPC (Creswell & Plano Clark, 2011). The study was approved by the Centre hospitalier universitaire de Sherbrooke ethics committee for health research on humans (#14–115). Individual identity was not revealed in any way and individual responses to the questionnaires were subsumed in the group results.

Quantitative phase

Sampling and recruitment

Postal questionnaires were sent to all members of Osteopathy Quebec (largest professional association in Quebec) as well as family physicians involved with pediatric patients and pediatricians without a subspecialty in Quebec, as recorded in a local medical directory. To maximize the response rate, a reminder postcard was sent two weeks after the initial mailing of questionnaires and a second questionnaire was sent two weeks later (Dillman, 2014).

Data collection

The initial questionnaires were developed based on a literature review to document various aspects of collaborative practice (30 items for physicians and 12 for osteopaths). Items collected that are directly related to enablers of referrals or professional relationships (11 for physicians and five for osteopaths) are shown in Appendix 1 – see online supplementary file. Optional participants' open-ended comments and sociodemographic data, including sex, number of pediatric patients/week, type of practice, personal consultation of an osteopath (for physicians only) and previous health professional training (for osteopaths only), were also collected. Content of the questionnaires was first pretested with two physicians, one pediatrician, three osteopaths, and an expert on IPC and questionnaire development. The modified version was piloted (procedure and duration) with physicians (n = 4) and osteopaths (n = 4). Except for content validity, the validity and reliability of the questionnaires were not verified. Quantitative results also helped to identify the types of participants to be purposefully selected for the qualitative phase as well as which elements to explore in depth.

Data analysis

Quantitative data from the questionnaires were analyzed using descriptive statistics, and Chi-squared or t-tests (normality of the data was verified visually) to identify statistically significant ($p< 0.05$) associations between variables and referral or presence of a professional relationship. The number of referrals by physicians was converted to a dichotomic variable (at least one referral/month: yes/no). In case of missing data (ranging from 4 to 19), frequencies were calculated based on the total number of responses for the question. Analyses were performed using SPSS 17 (SPSS Inc., Chicago, IL). Participants' open-ended comments were categorized using thematic analysis.

Qualitative phase

Sampling and recruitment

Following the quantitative data analysis, semi-structured individual interviews were conducted with a subset of 10 physicians (six pediatricians and four family physicians) and 11 osteopaths. To obtain a variety of profiles for the interviews, survey participants were selected using a purposeful sampling method according to their self-report of factors associated with referrals and professional relationships. The quantitative data that could benefit from further exploration were determined from significant or insignificant results, strong

predictors of referrals, extreme and unexpected results, and sociodemographic data (Creswell & Plano Clark, 2011).

Data collection

A semi-structured initial interview guide was developed base on the chiropractor physician model of collaborative practice (Mior et al., 2010), quantitative results that warranted more exploration, and comments collected via the survey. The interview guide consisted of nine open-ended questions allowing participants to describe their experiences with collaboration, and their perception of enablers of and barriers to IPC between physicians and osteopaths working with pediatric patients. Participants were given ample opportunity to make subjective observations and reflect on the meaning of their experience (Poupart et al., 1997). Subquestions were used where necessary to expand upon a theme (Kvale, 2009). The initial interview guide (Appendix 2 – see online supplementary file) was pilot-tested with a family physician, a pediatrician, and an osteopath. The guide evolved following ongoing analyses of previous interviews. Written consent was obtained prior to each interview. Interviews lasted between 26 and 76 minutes and were conducted face-to-face or via video conferencing depending on the geographic location. Sequential and concomitant data analyses were performed. The process and interviewee sampling were repeated until saturation of the themes was reached.

Data analysis

The interviews were recorded, transcribed and uploaded in NVivo 10 (Burlington, MA). A first reading was performed soon after transcription to reach a general understanding of the data (Creswell & Plano Clark, 2011). Categories were identified using the chiropractor-physician model of collaborative practice and emerging data (Miles, Huberman, & Saldana, 2014) according to common characteristics in terms of enablers and barriers to the development of IPC. Five randomly selected interviews were independently coded and discussed among the authors. After discussion, agreement was obtained for all themes. Triangulation of sources (family physicians, pediatricians and osteopaths) and methods was used to ensure quality of the data.

Meta-inferences

Ongoing thematic analysis of the interview content included a complementary analysis of the quantitative data from the questionnaires, which in turn shed light on the qualitative data. Meta-inferences were obtained by this iterative process and confrontation of the quantitative and qualitative data (Onwuegbuzie & Johnson, 2006).

Results

Quantitative data

Characteristics of participants

A total of 274 physicians (response rate 14%) and 297 osteopaths (42%) completed the survey. All surveys were considered for analysis and 211 included open-ended comments. Characteristics of participants are summarized in Table 1. The mean number of pediatric patients seen in a week was 18.8 (SD = 15.2) for family physicians, 59.8 (SD = 38.9) for pediatricians, and 5.1 (SD = 4.9) for osteopaths. Near half of the osteopaths had previous training as health professionals (physical therapists, occupational therapists, nurses, chiropractors and physicians).

Table 1. Characteristics of participants (quantitative phase).

	Physicians (n = 274)	Osteopaths (n = 297)
Characteristics	Frequency (%)*	Frequency (%)
Gender (female)	202 (73.7)	236 (79.5)
Medical community practice	132 (48.7)	n/a
Personally consulted an osteopath	122 (44.5)	n/a
Practice other than only private	274 (100.0)	11 (3.7)
Previous university training†:		
Physical therapist		99 (33.3)
Occupational therapist		21 (7.1)
Kinesiologists		18 (6.1)
Sports therapists		18 (6.1)
Biologist/biomedical		12 (4.0)
Nurse		10 (3.4)
Physical education teachers		10 (3.4)
Psychologist/neuroscience		10 (3.4)
Basic science/management		5 (1.7)
Chiropractor		3 (1.0)
Physician		2 (0.6)
Veterinary		1 (0.3)
Pharmacist		1 (0.3)
No previous university training		87 (29.3)

*Percentages reflect missing data (2 or 3 respondents)
†For osteopaths only
n/a: not applicable

Communication including referrals and professional relationships

Over a two-week period, osteopath respondents saw a total of 1293 new pediatric patients, 269 of whom (21%) were directly referred by physicians. Near half of the physicians reported that they referred at least one pediatric patient per month to an osteopath (Table 2). The main possible reasons reported by physicians for referrals were torticollis, plagiocephaly, musculoskeletal pain or dysfunction, digestive concerns (colic, reflux, regurgitation, constipation and abdominal pain), recurrent otitis media, headache, breastfeeding difficulties, excessive crying, and gait concerns. Osteopaths said that they referred patients to physicians for complicated conditions, such as severe plagiocephaly, digestive concerns (severe reflux, regurgitation with weight loss, suspicion of intolerances, chronic constipation, etc.), signs of scoliosis, persistent cough, or concerns about neurological or orthopedic signs.

Although more than one third of the physicians and osteopaths mentioned having professional relationships with each other (Table 2), very few osteopaths considered their collaboration with physicians to be frequent or very frequent (7% with family physicians and 3% with pediatricians). For physicians, there was a statistically significant association between community practice or having personally consulted an osteopath and the presence of a professional relationship ($p< 0.001$). For osteopaths, a statistically significant association was found between a higher number of pediatric patients seen and the presence of a professional relationship ($p< 0.001$). There was no association between osteopaths previously trained as health professionals and professional relationships ($p= 0.274$). Finally, no statistically significant association was observed between osteopaths with

Table 2. Quantitative results for communication, practice parameters and service delivery aspects.

Communication	Physicians Frequency (%)	Osteopaths Frequency (%)
Referral to an osteopath (at least once/month)	122/267 (45.7)	n/a
Professional relationship (yes)	96/269 (35.6)	122/297 (41.1)
Practice parameters related to osteopathy and pediatric patients		
Positive experiences reported by parents	245/260 (94.2)	
Negative experiences reported by parents	82/255 (32.2)	
Osteopathy is appropriated for:		
Musculoskeletal pain	241/264 (91.3)	
Torticollis and plagiocephaly	235/267 (88.0)	
Colic	138/265 (52.1)	
Functional disorders	137/264 (51.9)	
General preventive healthcare	122/263 (46.4)	
Continuing education about osteopathy	22/270 (8.1)	
No sources of information about osteopathy	52/270 (19.3)	
Service delivery including positive influence of regulation	(n = 266)	(n = 297)
Greatly influenced	190 (71.4)	184 (62.0)
Slightly influenced	48 (18.1)	64 (21.5)
Not influenced at all	28 (10.5)	49 (16.5)

n/a: not applicable. (Sample sizes varied due to non-responses).

previous training as health professionals and the frequency of collaboration with family physicians (p = 0.850) and pediatricians (p= 0.455).

Practice parameters related to osteopathy and pediatric patients

Almost all physicians mentioned having parents express positive experiences with osteopathic interventions for their child while about one third had, at some point, parents reporting negative experiences (Table 2). The majority of physicians thought that osteopathy was appropriate for managing musculoskeletal pain and torticollis or positional plagiocephaly but very few reported having received some continuing education about osteopathy (Table 2).

There was a statistically significant association between having patients reporting positive experiences and physicians making osteopathic referrals at least once a month (p< 0.001). Perceived appropriateness of osteopathy was also associated with referrals. A lack of sources of information about osteopathy was associated with no osteopathic referrals (p< 0.001).

Service delivery including regulation

Finally, the majority of physicians and osteopaths indicated that they would be positively influenced by regulation and the development of a university-based program for osteopathy in Quebec (Table 2).

Qualitative data

Enablers

The strongest enabler of early development of IPC between physicians and osteopaths mentioned by participants was positive clinical results expressed by patients. For physicians, those positive experiences aroused an interest in learning more about osteopathy and fostered trust in osteopaths' competencies and openness to future referrals. Concretely, referrals were often limited to conditions for which many positive experiences were reported by patients. Physicians who had consulted osteopaths for themselves and had positive results also tended to limit their subsequent referrals to similar conditions. Osteopaths confirmed this phenomenon. Two physicians talked about those aspects:

> What makes us want to collaborate is the feedback we get from patients. When patients have had a good result, it definitely helps to build trust (Physician 6)

> When I consulted for me, it was for musculoskeletal problems and then my view of osteopathy may have been too narrow. But for me, when there is a musculoskeletal problem, an osteopath seems to be the right person to address that specific problem (Physician 3)

Osteopaths believe they must objectify and document changes in the various conditions they treat to enable productive discussions about those clinical changes with other health professionals, including physicians. One osteopath explained that some physicians developed their trust in osteopathy only when they observed objective results after the intervention:

> Physicians need more objective measures. They want to know what we are doing. They want to know what the situation was before and the result after (Osteopath 11)

Osteopath's previous training and pediatric experience.

Physicians expressed their preference to collaborate with osteopaths who are also physical therapists or have had some training as health professionals because they are familiar with these professions. They are also more confident that those osteopaths have sufficient scientific knowledge. One physician mentioned that a physiotherapist-osteopath is the "pinnacle" for treating musculoskeletal problems. Many osteopaths noted that with the great variability in osteopathic education programs in Quebec, it is difficult for physicians to be confident that the osteopath their patient sees has all the required competencies. The

predisposition to refer to osteopaths who are also trained as health professionals is a way for physicians to be reassured:

> Honestly, I think that what helped us in the past was the fact that osteopathy was open to people who had a strong background in health. Now there are several different ways to get the diploma that are not equivalent to one another. So it is harder for physicians to know who is who (Osteopath)

Physicians also want parents to consult osteopaths who have a good reputation with the pediatric population. From experiences reported by parents, physicians often hear the same names of osteopaths working with children in their community over and over again, and some keep those names for future reference. When they did not know of any osteopaths, they simply recommended that parents ask for an osteopath specializing in pediatrics.

Respect for professional boundaries. Respect for professional boundaries is an important issue for physicians when they refer patients to osteopaths. Physicians expect osteopaths, like any other professionals, to know the limits of their practice, know when to be concerned and when to refer patients to conventional medicine. They felt comfortable referring to osteopaths when they trusted that training had prepared the latter to recognize what is outside their scope of practice or what requires an additional intervention:

> I expect that if a baby has a lot of reflux, yes, they could do something to help the baby but at the same time they should tell parents, for example: "You must see a pediatrician, make sure the baby doesn't lose weight". Similarly, with musculoskeletal concerns, I trust that the osteopaths I send patients to are able to recognize medical alarm bells, refer patients to physicians, and seek medical attention without delay (Physician 9)

Osteopaths agreed that their training should prepare them to recognize medical conditions and respect areas of expertise in order to establish a productive collaboration. They believe that collaborative practice can also be improved if osteopathy is a potential solution for conditions for which conventional medicine has little to offer. Physicians also said that osteopathy can be very useful when conventional medicine reaches its limit and that a collaborative approach can solve problems faster, particularly for musculoskeletal conditions. Respect for professional boundaries and complementarity of care influencing IPC was discussed by one interviewee:

> Osteopaths are primary care practitioners. It is important to be trained to recognize the signs and symptoms of pathological conditions. We treat functional problems. If we try to treat pathological problems, we take the place of physicians. I don't think we will be welcome then. However, if we treat functional problems for which there is no medical treatment that can help, I think we'll be welcomed as collaborators (Osteopath 1)

Perceived safety of osteopathy. In both survey comments and interviews, physicians indicated that osteopathic interventions are gentle and safe for pediatric patients. Many physicians are comfortable with parents consulting an osteopath because they think that osteopathy will not harm the child. This view influenced their predisposition to collaborate:

> I have no evidence showing that osteopathy is harmful over all the years they have been there (Physician 7)

> Certainly with pediatric patients, we trust osteopaths because we know they treat patients gently (Physician 6)

This notion of safety associated with the profession of osteopathy might, however, be viewed with caution; as one osteopath put it, "If it helps, it can also hurt, I think" (Osteopath 1).

Patient as a hub. Physicians mentioned that, in the last 10 years, they have seen a lot more parents consulting osteopaths, especially for young babies. Having those parents share their experiences has given physicians an interest in understanding and learning more about osteopathy. Both physicians and osteopaths reported that parents often consult osteopaths before asking their physician for advice:

> It is happening more and more that patients see an osteopath. I will refer sometimes but more often patients have already seen an osteopath before they see me. This is especially true for babies, in fact, for reflux or plagiocephaly (Physician 9)

> I don't think that parents go to a physician to ask for a prescription for osteopathy but I think that parents often go to an osteopath for treatment before going to a physician (Osteopath 4)

If parents have already consulted an osteopath by the time they see a physician, they are often the ones who initiate or request formal communication between the practitioners for the well-being of their child:

> Sometimes the parent says: "Can you write it down for me? I'm not really comfortable. I don't remember some of the signs you mentioned." It's to support them when they see the physician. It's almost more to help the parent than to talk to the physician because I never get a response from physicians anyway (Osteopath 6)

Barriers

Language. One of the barriers to IPC mentioned by participants was the absence of a common language. Osteopaths reported difficulty communicating effectively with other health practitioners, including physicians. According to osteopaths, they worked hard to communicate simply and clearly, using language that physicians understand. Writing a letter can be stressful and require considerable time, even for short reports. Osteopaths with previous training as health professionals felt more confident in their writing skills but were still challenged by the language aspect. The biggest issue of credibility reported by osteopaths was their inability to clearly explain their osteopathic treatment to physicians in scientific language. Osteopaths also mentioned that, in the context of collaboration with biomedical health professionals from the health system, communication skills are not taught during their training, despite their importance:

> I'm not comfortable writing to physicians. We received no training on what we can or cannot say in such a letter. I'm afraid to say something a physician may find insulting or unacceptable… It would be helpful to have our training include written standardized communication methods to follow up with other professionals so that we have a common language (Osteopath)

Misunderstandings arising from differences in profession-specific language are frequent and can be confusing for physicians. They

believe this confusion is not associated with a lack of recognition of osteopaths' competencies but with not speaking the same language, making it difficult to communicate and understand each other. Some physicians would prefer to receive a short note from the osteopath explaining "strange things" resulting from patients being the sole source of information about treatment:

> I believe there are some benefits but patients often report things osteopaths have said that don't make any sense (Physician)

Organizational and legal context. Physicians talked about the difficulty referring a patient to someone whom they are not sure is properly trained. They are concerned about people claiming to be osteopaths. In addition, according to many physicians, current training varies too much from one osteopath to the next to be able to work together if there is no personal relationship. Osteopaths tended to agree with this position and thought that regulation would facilitate collaboration because "physicians won't be afraid to refer anymore" (Osteo 2). Regulation might in fact be the first step toward IPC:

> Regulation provides a frame. Once the frame is there, we will be able to open the door a little more on what is behind the frame, to open the door and get a better understanding of how osteopaths work (Physician 2)

However, one physician who had experienced success with osteopathy did not consider the current absence of regulation to be a barrier:

> This is not a barrier. There is no regulation yet but in medicine there is regulation and yet not everyone is super-competent. There are large individual differences … In any case, with the very good results I have seen, regulation or not, for me it doesn't change anything, I will continue to refer (Physician 5)

Some physicians and osteopaths said that regulation is needed but official approval from medical regulatory bodies will also influence collaboration:

> "When [osteopaths] have a professional order, I think it will reassure us. And if our own professional bodies or experts recommend the use of this approach, as physicians we will feel more comfortable recommending it officially … Personally, I need to be reassured that referring to an osteopath is the right thing to do, that it is okay, and that we'll be supported if we refer for some reason and something goes wrong." (Physician 8)

Uncertainty regarding one another's roles. Lack of knowledge about one another's roles is a well-known barrier to collaboration. Physicians reported that they had very little knowledge about osteopathy. According to osteopaths, physicians are not informed about what an osteopath can do and this is perceived to be the biggest obstacle to greater collaboration. To overcome this lack of knowledge, information about each other's roles needs to be available and shared. Some physicians clearly stated that continuing education about osteopathy and its possible contribution for conditions discussed in their guidelines and literature, and interprofessional education opportunities are not available to gain more knowledge:

> We do not necessarily know what services osteopaths provide. This means prescribing something we don't know anything about. It's a bit difficult (Physician 1)

> Continuing education about osteopathy is not available for physicians (Physician)

Osteopaths thought they had a role to play in the dissemination of information about osteopaths' roles for lesser-known reasons for referrals but, from their perspective, they would require more scientific evidence to help them do so:

> I think that information is the cornerstone … If we want collaboration with physicians, we need to inform them about what we can do. In the musculoskeletal field, I think this is already going quite well but if we look at visceral or cranial aspects, for example, or reasons for consultation that are less obvious to [physicians]… we can only inform them if there are clinical outcomes and also scientific evidence available (Osteopath 1)

Even though physicians seem to know less about osteopaths' roles, both practitioners need to learn more about one another's roles in order to collaborate, as mentioned by this physician:

> If we know them, establish a relationship, and know they respect their scope of practice, and if there are good results and things are positive, collaboration will most likely increase and we will refer more. Similarly, if osteopaths know what we do, they will have less false perceptions about physicians … I think on both sides it helps to reduce prejudices (Physician 9)

Paucity of interprofessional interactions. According to physicians, they rarely communicate directly with osteopaths. Instead, communication is indirect, with patients reporting back to their physician about the care they received from osteopaths. The majority of osteopaths said that, in addition to not having direct communication, they rarely get answers from physicians following written communications:

> I get very little, if any, input from pediatricians and physicians. Feedback is given through the parent, so it is the parent who tells me: the pediatrician thinks this and the pediatrician did that. I never have an opportunity to talk on the phone to a family physician or pediatrician (Osteopath 6)

Having the opportunity to speak to each other, at least at the beginning of a collaboration, might help further communication, as reported by one osteopath:

> If I could get in touch with the physician, if we could meet, I think it would make things easier to say: OK, how do we refer patients to each other? Now, I'm not sure who I'm talking or writing to, nor do I know how it is received. I don't know how I should present my information (Osteopath 3)

Some osteopaths even stopped communicating patient-related information to physicians because they did not get any feedback and felt that unilateral communication is not collaboration:

> Initiating a communication when there is no feedback is frustrating over the long term, it's not a real collaboration, there is no exchange […] We do it because we think that at some point, they will understand. Yes, one time out of ten, something happens but it's not very rewarding for me as an osteopath. If the collaboration became a true collaboration, it would be something else (Osteopath 2)

Limited scientific evidence. Even though scientific production in osteopathy is increasing, many comments in the survey from both physicians and osteopaths pointed up the need to increase scientific evidence and research in osteopathy in order to foster collaboration:

> I will collaborate with osteopaths when they publish randomized controlled trials with valid data on the effectiveness of their interventions (Physician)

> Collaboration will be there only when osteopathic concepts are standardized and osteopaths have demonstrated their research capacity (Osteopath)

Physicians mentioned the need to increase scientific understanding regarding why and how osteopathy can help with some interventions unrelated to musculoskeletal problems:

> We hear about [the efficacy of osteopathy] for ear infections, for reflux, etc., but I must admit, I wonder what the evidence is for that. I'm not closed to the idea that it might help but I need to understand why and how, and what the science says about it (Physician 3)

When the concept of scientific evidence was explored with osteopaths, some agreed that this is essential to increase collaboration while others believe that osteopathy does not need scientific evidence for everything they do, just like other professions in which the practitioner's clinical expertise may be sufficient to intervene:

> If we are still waiting for scientific evidence from research, we will wait a long time [to intervene for] many conditions. I think at some point, we must forget that. Conventional medicine will play that game, saying: Yes, but there's no data … There are plenty of things in medicine that are not supported by scientific evidence (Osteopath 6)

According to physicians, scientific evidence about osteopathy might exist but is not easily accessible. They also mentioned that professional regulators will have to be involved to facilitate the dissemination of information and evidence about osteopathy:

> I think there is scientific evidence […] I don't believe that medical colleges in the U.S. and faculties of medicine would agree to award degrees in osteopathy if there were no evidence behind it. In my view, the evidence is not accessible here because we don't have a regulatory body for osteopathy (Physician 7)

> If our regulatory bodies or the incoming professional regulator of osteopaths… can provide evidence or at least include osteopathy in guidelines for this or that problem in certain circumstances, I think it will help to increase referrals (Physician 8)

Meta-inferences

The in-depth exploration of enablers and barriers to IPC collaboration between physicians and osteopaths and the combination of quantitative and qualitative results revealed factors and interactions that are illustrated in Figure 1.

Discussion

This study provided an original and comprehensive understanding of important enablers and barriers that affect IPC between physicians and osteopaths involved with pediatric patients in day-to-day practice. The in-depth exploration of IPC phenomenon between physicians and osteopaths in private practice has highlighted some factors and processes specifically related to collaborative practice between CAM practitioners and physicians that are not involved in integrative health care clinics. The factors and interactions in such context are shown in an illustration that adds elements to the ones previously presented by the Mior et al. (2010) physician-chiropractor model.

Our findings suggest that positive clinical results reported by parents after osteopathic consultations are frequent in a routine physician's practice. The study also showed that this positive feedback is statistically associated with osteopathic referrals and is described as the most powerful enabler of the early building of trust and collaboration between physicians and osteopaths. Feedback from patients is important since it can help physicians fill their knowledge gap about the potential contributions of the approach (Chung et al., 2012). In the literature, repeated positive

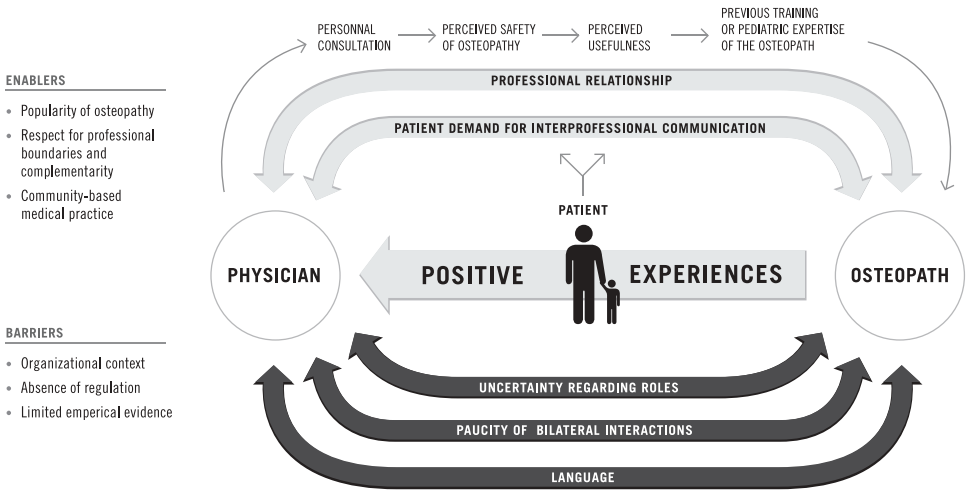

Figure 1. Enablers and barriers to collaboration between physicians and osteopaths for pediatric population. The upper half of the figure (including pale gray arrows) illustrates the enablers to collaboration, while the lower half of the figure (including the dark gray arrows) shows the barriers. The enablers placed on the thin arrow at the top of the figure act as catalysts specifically for physicians and enhence their collaboration with osteopaths.

feedback may encourage physicians to refer patients to CAM practitioners (Chung et al., 2012). However, repeated positive feedback in the present study seemed to have restricted referrals to reasons for consultation that had frequent positive results reported, like musculoskeletal problems, including torticollis and plagiocephaly. This suggests that physicians fill their knowledge gap with patient's feedback but are still not familiar enough with osteopathy to refer for other conditions. By not doing so, they do not get feedback from parents and do not see clinical results for those other conditions.

According to qualitative data from the survey comments and interviews, dual training of osteopaths emerged as a strong enabler of the development of trust and collaboration. However, although the concept of health professionals trained as osteopaths was widely discussed by participants, no statistically significant association was found between those osteopaths and having a professional relationship with physicians or with rating the level of collaboration with physicians as frequent. This could be due to the presence of other characteristics encountered in day-to-day clinical practice that reassure physicians about the safety of the therapist, such as having a good reputation with pediatric patients. In fact, osteopaths who had a greater number of pediatric patients in their practice were associated with the presence of professional relationships. Osteopathy in general was also perceived as a non-invasive safe solution and safe therapy.

Another important enabler of IPC in the present study related to safety was respect for professional boundaries. Both physicians and osteopaths agreed that, in order to be trustworthy collaborators, osteopaths must respect their scope of practice, be able to recognize medical concerns and refer patients to physicians when appropriate. According to Gray and Orrock (2014), it is important for both physicians and CAM practitioners to understand and acknowledge their own limitations in terms of scope of practice in order to foster trust in referrals to the other practitioner and minimize medicolegal concerns surrounding safety and the duty of care for a referral.

According to the results, language is a barrier to collaboration. Effective communication is challenging for some osteopaths, who said they had difficulty explaining their interventions in a common, scientific language. This might be due to differences in paradigms between these practitioners, which tend to hinder effective communication (Chung et al., 2012; Keshet et al., 2013). To facilitate communication, CAM practitioners are asked to explain objective evaluations and treatments based on biomedical epistemology (Keshet et al., 2013). However, as revealed by some of the osteopaths in the present study, translating their palpation findings, for example, into biomedical terms is not always easy. Furthermore, their training did not prepare them to communicate their osteopathic evaluations and treatments using a common, scientific language adapted to current biological plausibility principles. Osteopathic educators and practitioners have been slow to adapt to changing and challenging scientific evidence that conflicts with traditional profession-related theories and terminologies (Fryer, 2008). The utilization of biomedical terminology, eased by dual training, would facilitate the communication process between conventional and CAM practitioners (Gaboury, Bujold, Boon, & Moher, 2009; Keshet et al., 2013; Mior et al., 2010) but could result in an asymmetrical situation, with most of the effort being made by CAM practitioners, to adapt their language to the biomedical paradigm (Keshet et al., 2013). For both osteopaths and physicians, independently of their paradigm, using easier to understand profession-specific terminology should be one of their concerns when writing to other practitioners.

Osteopaths mentioned writing letters using biomedical terminology as a way to inform physicians about the potential contribution of osteopathy. However, a lack of feedback from physicians negatively impacted the motivation to pursue these communication efforts. In a collaborative context, CAM practitioners expect timely feedback from physicians in order to feel respected (Chung et al., 2012). Informal direct communications, such as hallway discussions in an integrative clinic, are known to reinforce communication and interprofessional relationships (Chung et al., 2012; Gray & Orrock, 2014) and provide more opportunities to learn from one another (Keshet et al., 2013). However, there is rarely such direct communication in the private practice of osteopathy. Little face-to-face interaction challenges communication and can lead to a lack of understanding regarding the scope of practice of each practitioner (Soklaridis, Kelner, Love, & Cassidy, 2009). With the pending regulation and development of a university-based osteopathic program in Quebec, early interprofessional education was mentioned as a potential solution for fostering knowledge of each other's roles, mutual referrals, communication, and collaboration. Physicians would also like to have osteopathy included in some of their guidelines or continuing education sessions in order to get readily accessible information and increase their knowledge. Interprofessional education is critical to enhance collaboration since a lack of knowledge is one of the most frequent reasons given for disapproving of CAM use (Chung et al., 2012).

The data here also pointed to a lack of access to scientific evidence or guidelines about osteopathy that creates uncertainty for referrals. A lack of scientific evidence, especially from controlled randomized trials, is a common argument from opponents of CAM use (Chung et al., 2012). According to most of the physicians and osteopaths interviewed, scientific evidence about the effects of osteopathy for non-musculoskeletal conditions would help the communication and referral process. However, some physicians in this study were open to the idea of patients consulting an osteopath even in the absence of scientific evidence. Physicians sometimes overlook limited evidence and prefer to rely on their own clinical experience, especially when a CAM treatment option is not going to harm the patient (Jarvis, Perry, Smith, Terry, & Peters, 2015). Similarly for some physicians, positive feedback from patients partly replaces the need for evidence from clinical trials (Chung et al., 2012).

The current organizational and legal context was mentioned as being particularly problematic for collaboration. The lack of educational standards and regulations led physicians to rely on their own professional relationships when referring to osteopaths they trusted. Referring to osteopaths with previous health sciences training was also perceived as a way to feel more secure when they did not personally know the other practitioner. Both physicians and osteopaths thought that osteopathy should be regulated and that regulation will foster collaboration. Greater trust in the robustness of practitioners' training and regulatory

procedures is known to enhance physicians' trust when referring to CAM practitioners (Jarvis et al., 2015). However, even with regulation, information about the other professional's role will still be needed. Physicians noted that regulation will help but they also expected confirmation from their own regulatory bodies that osteopathy is appropriate for certain conditions. Indeed, opposition from physicians' regulatory bodies inhibits their members' collaborative practices (Gaboury et al., 2009).

In this study, practitioners reported that parents often consulted osteopaths before consulting their physicians and most of the time without seeking prior medical advice. The most common influence in deciding to consult a CAM practitioner for a child is advice from a friend or family member and not medical advice or other informed decision-making (Gruber, Ben-Arye, Kerem, & Cohen-Kerem, 2014). In the literature, adult patient demand for osteopathy is known to be associated with referrals (Wardle, Sibbritt, & Adams, 2013) but in the present study, practitioners mentioned that parents' demand was more for communication between practitioners afterwards. According to the physicians interviewed, parents reported on their experience but there was rarely direct communication between practitioners. This aspect needs further study, including the parent's perspective in the context of physician-osteopath interactions.

The results of this study lead to some important recommendations that could help foster the development of IPC between physicians and osteopaths and safe patient-centered care. Encouraging communication between physicians, parents of pediatric patients, and osteopaths is critical. Communication should go beyond simple feedback from the patient and include the clear exchange of information about relevant patient outcomes. To initiate and facilitate effective communication, communication skills using common scientific language should be included in osteopaths' training. Participants also recommended collaboration between regulatory bodies of both professions to increase access to scientific evidence and best practices, provide information about osteopathy in medical curricula and continuing education sessions, and include osteopathy in medical guidelines when appropriate. Finally, regulation of osteopathic practice and standardization of osteopathic training are perceived as essential in the collaboration between physicians and osteopaths.

This study has a number of limitations. First, despite efforts to maximize participation in the quantitative phase of the study, the physicians' response rate was low, albeit typical for this population (Cho, Johnson, & Vangeest, 2013). This may affect the validity of the proportions regarding physicians' responses in the questionnaire. It may also limit the generalization of the quantitative results, including the high percentage of physicians referring to osteopaths. The addition of individual interviews with physicians who do not refer to osteopaths, the higher rate of participation of osteopaths, the triangulation of sources, and the variety of data collection methods (including the grid documenting actual physicians' referrals to osteopathy over a two-week period) help to partially reduce bias related to the low physicians' response rate. Second, it is possible that practitioners who participated in the survey were more interested in IPC or osteopathy than their colleagues who did not. Indeed, almost half of the physicians who responded to the survey had consulted an osteopath personally and slightly more than one third of all survey respondents mentioned having professional relationships. Hence, findings may underestimate the barriers to collaboration between physicians and osteopaths. Finally, despite a rigorous choice of participants for the qualitative phase, bias and extreme views (positive or negative) may have been present in the interviews. On the other hand, saturation of themes was obtained, which can limit selection bias.

Concluding comments

This study reported characteristics of interprofessional collaboration between physicians and osteopaths involved with pediatric patients and highlighted specific enablers of and barriers to the development of IPC between these practitioners. Collaboration is mainly indirect and often limited to referrals. Enablers of and barriers to the development of IPC between physicians and osteopaths, although similar to other dyads of collaborators, appeared to be specific to this particular dyad. Positive clinical results are the strongest enabler and also seem to determine the reasons for referrals. Recommendations are provided to increase collaboration and referrals within the broader scope of the practice of osteopathy, especially in the current context of the pending regulation in Quebec. These results could be used to guide efforts to promote productive collaboration between conventional and CAM practitioners and safe patient-centered care.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the writing and content of this article.

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