

Chiropractic treatment of patients younger than 18 years of age: Frequency, patterns and chiropractors' beliefs

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OBJECTIVES: To explore how and when chiropractors are involved in the care of patients younger than 18 years of age, and to examine chiropractors' beliefs about treating paediatric patients.

DESIGN: A cross-sectional survey of a random sample of 140 chiropractors practising in Alberta. Data were collected by means of a mailed questionnaire, which elicited practice information and chiropractors' beliefs, and included closed- and open-ended questions related to six vignettes of paediatric health problems.

RESULTS: Fifty-seven per cent of chiropractors responded to the questionnaire. All chiropractors indicated that they treat patients younger than 18 years of age. Nine per cent of respondents do not treat patients younger than age two years, and 4% do not treat patients from ages six to 11 years. On average, 13% of chiropractors' total patient load over the month preceding the completion of the questionnaires consisted of patients younger than the age of 18 years. With increasing age, patients are more likely to present with musculoskeletal problems (23% of patients younger than age two years, 84% of those aged 14 to 17 years). Chiropractors reported that they provided musculoskeletal treatment regardless of the cause of the problem. A high percentage of chiropractors refer to physicians and reported that they would like to provide concomitant care with physicians.

CONCLUSION: The present study has shown that chiropractors do treat children and that their opinions about this practice vary by specific condition. In addition, substantial percentages of chiropractors indicated that they would like to work with physicians in treating patients with non-musculoskeletal conditions.

Le traitement chiropratique de patients de moins de 18 ans : La fréquence, l'expression clinique et les convictions des chiropraticiens

OBJECTIFS : Explorer comment et quand les chiropraticiens participent aux soins de patients de moins de 18 ans, et examiner les convictions des chiropraticiens au sujet du fait de traiter des enfants.

MÉTHODOLOGIE : Enquête transversale d'un échantillon aléatoire de 140 chiropraticiens exerçant en Alberta. Les données ont été colligées au moyen d'un questionnaire expédié par la poste qui sollicitaient de l'information sur la pratique et les convictions du chiropraticien et incluait des questions fermées et ouvertes portant sur six capsules relatives à des troubles de santé pédiatrique.

RÉSULTATS : Cinquante-sept pour cent des chiropraticiens ont répondu au questionnaire. Tous ont indiqué qu'ils traitaient des patients de moins de 18 ans. Neuf pour cent ne traitent pas de patients de moins de deux ans, et 4 %, de patients de six à 11 ans. En moyenne, 13 % de la charge totale de patients des chiropraticiens au cours du mois précédant les réponses au questionnaire étaient constitués de patients de moins de 18 ans. Plus ils vieillissent, plus les patients sont susceptibles de présenter des troubles musculosquelettiques (23 % des patients de moins de deux ans, mais 84 % de ceux de 14 à 17 ans). Les chiropraticiens ont déclaré qu'ils prodiguent un traitement musculosquelettique quelle que soit la cause du problème. Un taux élevé de chiropraticiens aiguillent leurs patients à des médecins et ont déclaré qu'ils aimeraient offrir des soins concomitants avec ceux des médecins.

CONCLUSION : La présente étude démontre que les chiropraticiens traitent des enfants et que leurs avis à cet égard dépendent de la pathologie. De plus, un pourcentage important de chiropraticiens ont indiqué qu'ils aimeraient travailler de concert avec des médecins dans le traitement de patients ne souffrant pas de troubles musculosquelettiques.

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According to the Canadian Chiropractic Association, chiropractic is "a health discipline concerned with the diagnosis, prevention and management of health deficiencies reversible by natural means with emphasis on the interrelationship between the function of the nervous, musculoskeletal systems and their effects on the other systems of the human body using spinal adjustment and manipulation" (1). The philosophy of chiropractic is based on the premise "that the human body has the natural power to heal itself, but sometimes it needs help in putting that power into action. Chiropractic assists the natural healing process by helping maintain, restore or enhance health, and it does so without drugs or surgery." (1)

There is little information about the extent to which chiropractors treat patients younger than 18 years of age. A survey of Canadian chiropractors found that almost all of the respondents were involved in treating patients younger than the age of 18 years (2). The respondents indicated that they saw children for musculoskeletal conditions mostly. However, the percentage of the chiropractors' patient load that consisted of children and their beliefs about treating children were not assessed in the study. A recently published survey of chiropractic care for children in Boston, Massachusetts was conducted at the same time as our study (3); the survey assessed the extent of chiropractors' involvement in treating children, and their approach to childhood immunizations and treating a (hypothetical) two-week-old neonate with a fever. The results show that 11% of weekly visits to chiropractors were from children and adolescents. Thirty per cent of respondents reported actively recommending childhood immunizations, and 17% would treat a two-week-old neonate with a fever rather than referring the patient to a physician, osteopathic physician or emergency facility.

A study conducted in a paediatric outpatient clinic of a university hospital in Quebec showed that 11% of the children had consulted one or more alternative practitioners (4). Thirty-six per cent of these children had used chiropractic. The five most important reasons for seeking chiropractic treatment consisted of ear, nose and throat disorders, respiratory problems, musculoskeletal problems, gastrointestinal problems and preventive care. Exact percentages of children seeking chiropractic treatment for each of these reasons were not reported. A study of children attending a Chiropractic College Teaching Clinic in Oregon found that 42% presented with musculoskeletal problems, 20% with non-musculoskeletal complaints and 33% for general physical examinations (5).

Several outcome studies have been conducted to assess the efficacy of chiropractic treatment in patients younger than age 18 years. Most of these studies addressed nonmusculoskeletal health problems, including otitis media (6), enuresis (7,8), tonsillitis (9), colic (10), attention deficit/hyperactivity disorder (11) and asthma (12). Several of these studies found positive results; however, few (7,12) were randomized controlled trials. While

the randomized controlled trial of chiropractic treatment for enuresis conducted by Reed et al (7) found a positive result, its methodological quality was poor. The randomized controlled trial conducted by Balon et al (12) did not find a positive effect from chiropractic treatment for childhood asthma.

While chiropractors generally support the provision of chiropractic treatment to patients younger than 18 years of age (13), nonchiropractic professionals appear to be less supportive of chiropractic treatment for this age group (14,15). However, both groups of professionals tend to base their beliefs on clinical experience rather than scientific proof. No studies were found that systematically explored the beliefs of chiropractors. Information regarding chiropractors' beliefs were limited to comments included in clinical reports. Therefore, the objectives of the present study were to explore to what degree and for what health problems chiropractors are involved in the care of patients younger than 18 years of age, and to examine chiropractors' beliefs about treating patients in this age group.

METHODS

The study was a cross-sectional survey of a random sample of chiropractors practising within the province of Alberta. Data collection occurred from January 1997 to June 1997.

Data were collected by means of a mailed questionnaire. The questionnaire consisted of two sections. The first section contained a number of closed-ended questions that assessed demographic and clinical practice details. The second section contained six vignettes, which described short case scenarios of signs and symptoms of specific health problems, to assess chiropractors' beliefs about treating such cases. Respondents were asked to answer structured and open-ended questions pertaining to the vignettes. The health problems presented in the vignettes were asthma, tension headache, colic, otitis media, torticollis (wry neck) and health maintenance. The vignettes are presented in the Table 1. Although health maintenance is a reason for accessing a chiropractor and is not a health problem, it will be referred to as a health problem for the convenience of describing the study methods and discussing the results. Colic, otitis media and asthma were included in the study because they were found to be common problems presented to chiropractors in previous studies (2,4). Tension headache and health maintenance were chosen because, in response to a preliminary survey of this study, chiropractors indicated some concern over the treatment of these health problems. The chiropractors were concerned that health maintenance was not a valid form of treatment and that chiropractors did not have the necessary skills to treat tension headaches.

The vignettes were developed by the investigators by using symptoms and signs identified in Wasson (16), and Behrman et al (17). They were reviewed by 10 chiropractors and 10 family physicians in the Calgary region as a

TABLE 1: Vignettes used in questionnaires mailed to chiropractors in Alberta in 1997 to examine their beliefs about treating patients younger than age 18 years**Childhood asthma**

Mark is a 12-year-old male who presents with a cough and states that he has had problems with breathing. Mark says that his breathing is worse at night or when he is playing school sports in which running is involved. He tells you that his breathing is worse in the spring, but he has experienced shortness of breath frequently throughout the past year. Once, he was so short of breath that his mother allowed him to use her bronchodilators, which helped. When asked to take a deep breath, Mark's expiration is prolonged, and there is an audible wheeze. Mark's mother suffers from asthma, and both of his sisters have eczema.

Childhood colic

Andrea is a two-month-old female. Andrea's mother states that Andrea cries for several hours every day and has done so from when she was about two weeks old. She also states that the crying tends to get worse in early evenings and that she will only stop crying when she has exhausted herself. While conversing with the mother, Andrea is squirming and screaming, and the mother is unable to console her. The examination, despite her severe distress, indicated that Andrea is well grown and seems well nourished. Andrea has normal vital signs and you detect no abdominal masses. When asked, her mother states that Andrea has regular bowel movements and that her abdomen is only tense while she is crying.

Tension headache

Dan is a 17-year-old male. Dan presents with a headache. He describes the pain as an aching pain that tends to get worse as the day progresses. The headache is described as being located near the base of his skull and, on occasion, it extends up toward his temples, forming a band of pressure around his head. Dan states that he does not vomit when experiencing headaches and has no problems visually. Dan notes that massaging his scalp or neck provides some relief, although when he stops the headache returns immediately. Dan states that his headaches are worse during the week, but he rarely experiences headaches on weekends. When asked how long Dan has suffered from headaches, he estimates that they started around the beginning of his second year in high school (six months ago). Dan is a member of the senior volleyball team and a representative on the student council. The physical examination indicates that the cervical paraspinal muscles and trapezius are tender to pressure. The neurological examination yields unremarkable findings.

Otitis media

Marie is a five-year-old female. Her mother states that Marie has recently been suffering from a cold, but she does not appear to be improving. While sick, Marie has run a high fever and tended to rub her ears often. You notice that Marie constantly pulls at her right ear, and when asked how her ear feels, she states that it hurts and feels plugged. When examining her, you notice that the tympanic membrane is inflamed and bulging.

Torticollis

Heather is a 12-year-old female. Heather tells you that her neck has been very stiff since waking up yesterday morning. She states that it has not improved or worsened since yesterday morning. During the examination, you notice that her neck is acutely tender and is held in a slightly left rotated position. When asked to describe the pain, Heather states that the pain is only on the left side of her neck and upper back region. She also mentions that she sometimes feels a muscle spasm in the same area where the pain is located. There is no history of swollen lymph nodes or pharyngitis.

Health maintenance

Desmond, a 10-year-old boy, presents to your offices for a check-up visit. The boy's mother relates to you that he has had no recent health complaints, and that he is an active sports enthusiast and enjoys hockey, skateboarding and football. Three years ago he broke his right collarbone while tobogganing. His mother further relates that his birth was difficult and required forceps extraction. He experienced several ear infections as a toddler, and eventually required tympanotomy tubes. He was also hospitalized at age four with pneumonia.

pilot phase to the study. The paediatrician on the study team conducted the final review of the vignettes. Both chiropractors and physicians agreed that these vignettes present a range of health problems that represent different degrees of controversy regarding chiropractors' involvement in treating these ailments.

The questionnaires were mailed out, and chiropractors who failed to respond within a month were contacted via telephone and reminded to respond to the questionnaire. One week following the contact by telephone, a second reminder was mailed to those chiropractors who had still not responded.

There were 485 practicing chiropractors in Alberta. To estimate population proportions with an accuracy of at least $\pm 10\%$, a sample size of about 100 was required (18). The sample size was increased to 140 to allow for

non-responses. Chiropractors involved in the development of the questionnaire or in the pretest were excluded from the study. To ensure that both rural and urban practitioners were represented proportionally, the sample was stratified by location of practice (rural population [less than 10,000] and urban population [greater than 10,000]).

Data collected in the questionnaire were analyzed descriptively using SPSS^X (SPSS, USA) (19). To assess associations, χ^2 tests or ANOVA analyses were used, depending on the level of measurement. To assess chiropractors' beliefs about the treatment of children, a qualitative content analysis was performed (20). This involved analyzing the content of the responses to the open-ended questions to determine themes or patterns. A theme is a recurring regularity emerging from the analysis and may be a

TABLE 2: Top three health problems presented to chiropractors by patients younger than 18 years of age, according to underlying medical complaint

Age group	Top three health problems presented to chiropractors	Chiropractors (%) having seen this problem during past month
Birth to 11 months	Gastrointestinal	57
	Prevention	31
	Musculoskeletal	57
12 to 23 months	Musculoskeletal	26
	Prevention	23
	Eyes or ears, nose and throat	18
2 to 4 years	Musculoskeletal	42
	Prevention	20
	Trauma	16
5 to 10 years	Musculoskeletal	68
	Prevention	18
	Trauma	16
11 to 13 years	Musculoskeletal	78
	Trauma	13
	Prevention	13
14 to 17 years	Musculoskeletal	84
	Trauma	15
	Prevention	12

phrase, sentence or paragraph embodying ideas or making an assertion about a topic. The study was approved by the Conjoint Health Research Ethics Board of the University of Calgary, Calgary, Alberta.

RESULTS

Of the 140 questionnaires that were mailed to chiropractors, four questionnaires were returned due to ineligibility. Of the remaining 136 questionnaires, 77 (57%) were returned completed. The sample was representative of the population of Alberta chiropractors with respect to sex ($\chi^2=0.36$, $P=0.55$), location of practice ($\chi^2=0.01$, $P=0.94$) and seniority categories ($\chi^2=0.50$, $P=0.78$), which were based on the number of years in practice.

The mean age of respondents was 37 years (range 25 to 72). Fifty-three per cent of respondents were younger than 40 years of age, and 88% were male. Fifty-six per cent of respondents were trained in the United States, and 44% in Canada. Sixty-three per cent of respondents indicated that they spent over 75% of their time in direct treatment of patients, 25% spent 25% to 75% of their time in direct treatment of patients and the remaining 12% spent less than 25% in the direct treatment of patients.

Ninety-three per cent of respondents had undertaken at least one form of paediatric training (mostly seminars [61%]), either before or after graduation. The remaining 7% of respondents did not answer the question relating to paediatric training. Ninety-six per cent of chiropractors indicated that they made paediatric referrals to other health care professionals, the majority of whom were family physicians. Sixty-nine per cent of chiropractors indicated that they receive paediatric referrals from other health care professionals, the majority of whom were family physicians (81%), followed by massage therapists (35%), dentists (11%) and physiotherapists (11%).

All chiropractors indicated that they treated patients younger than 18 years of age. However, 9% did not provide treatment to patients from birth to 24 months, 4% did not treat patients from ages two to five years and 1% did not treat patients from ages six to 11 years. On average, 13% of chiropractors' total patient load during the month preceding the completion of the questionnaire consisted of patients younger than 18 years of age. The most common presentations to chiropractors by patients from the ages of one to 18 years were musculoskeletal in nature. Patients younger than one year of age most often presented with gastrointestinal problems (Table 2). Chiropractors indicated that spinal manipulative therapy was their primary form of treatment in all age categories. This was followed by nutritional counselling, which was most common for patients younger than age five years, and soft tissue manipulation and exercises, which were most common for patients aged 11 years and older.

Following the presentation of each vignette, respondents were asked to choose one of five options to indicate how they would manage each case. The results are presented in Table 3. Chiropractors surveyed were much more willing to treat headaches and torticollis than otitis

TABLE 3: Management practices selected by chiropractors in response to vignettes outlining health problems

Health problem (responses)	Initiate therapy (%)	Provide concomitant care with conventional health practitioner (%)*	Refer to conventional health practitioner (%)*	Do not treat or refer out (%)	Other (%)	Total (%)
Otitis media (n=76)	11	66	18	4	1	100
Asthma (n=72)	22	70	6	1	1	100
Colic (n=71)	52	35	3	7	3	100
Headache (n=76)	86	13	0	0	1	100
Torticollis (n=76)	94	4	0	0	3	101 [†]

*Mostly physicians; [†]Amount does not equal 100% because of rounding

media and asthma. About 50% of respondents would treat a child presenting with colic. Concomitant care was less likely to be selected for conditions that chiropractors commonly treat. The high percentage of chiropractors who would provide concomitant care for asthma may partly be due to the chronic nature of the condition, which means that most of these patients would already be seeing a physician. A high percentage of chiropractors also indicated that they would provide concomitant care for patients with acute otitis media. This most likely explains the low percentage of referrals to conventional health practitioners. A much smaller percentage of chiropractors would provide concomitant care for colic, possibly because a parent's first choice of treatment is a physician, and chiropractic treatment is perceived as being a secondary choice by most parents of patients with colic.

The qualitative data showed that chiropractors generally perceived treatment outcomes to be better for headaches and torticollis than for otitis media, colic and asthma. Eighty-eight per cent of chiropractors indicated having had previous experience treating otitis media and colic, 93% indicated experience treating asthma, and 99% indicated experience treating tension headaches and torticollis.

When providing treatment for either musculoskeletal or nonmusculoskeletal problems (excluding health maintenance, which will be discussed later), chiropractors believed that they provided treatment to correct musculoskeletal dysfunctions. For health problems in which musculoskeletal dysfunction is not commonly considered to be the cause of the problem (ie, asthma, colic and otitis media), chiropractors believed that they could provide relief with musculoskeletal treatment. Relief is thought to occur by correcting a musculoskeletal problem that is directly related to the health problem or by enhancing the body's ability to heal itself. Chiropractors also believed that they should play a role – albeit a role secondary to physicians – in the treatment of nonmusculoskeletal health problems (ie, the more controversial health problems). This belief again stemmed from the chiropractors' clinical experience that some relief may be provided by correcting a musculoskeletal problem that is directly related to a nonmusculoskeletal health problem. Finally, chiropractors believed that, when presented with a nonmusculoskeletal health problem, they would not provide treatment without ensuring that contraindications to chiropractic care are ruled out.

When the questionnaire was developed, maintenance care was defined as the provision of treatment to prevent any health problems from occurring. Throughout the study, it became clear that there was an alternate definition of maintenance care. The second definition was care provided after the initial treatment to maintain the benefits accrued from treatment. Because there was some confusion over the definition, questions assessing the use of health maintenance must be considered cautiously. The results indicated that chiropractors provided maintenance care to prevent health problems from occurring

(most commonly for acute problems, ie, otitis media, torticollis and colic) or to maintain treatment effects (for more chronic problems such as asthma and tension headache). Beliefs expressed in response to the vignette on health maintenance identified opposition and support for the provision of such care. Beliefs against the use of health maintenance included that young patients do not require ongoing care; there is no evidence on the benefits of maintenance care; acute problems do not require ongoing care; empowering the patient through home exercises would decrease the need for maintenance; and because a full resolution is expected, maintenance care would not be required. Some chiropractors who opposed maintenance care provided conditions under which such care would be appropriate. These chiropractors would provide maintenance care only to re-evaluate their patients on an 'as needed' basis or if the condition was a reoccurring problem. Respondents with beliefs that favour the use of health maintenance indicated that health maintenance is a form of screening for spinal dysfunctions. In accordance with chiropractors' proactive approach to spinal health, the respondents supported routine check-ups to ensure that the spine was functioning and developing properly. In keeping with responses to the other vignettes, the chiropractors were consistent in their belief that a musculoskeletal problem must be identified before treatment is provided.

DISCUSSION

Chiropractors regularly treat patients younger than 18 years of age. We found that about 13% of chiropractors' total patient load consists of patients under the age of 18, which is very similar to the 11% rate found by Lee et al (3) in the Boston area. The majority of paediatric health problems presented to chiropractors were musculoskeletal in nature; however, younger patients commonly presented nonmusculoskeletal health problems. While providing treatment for health problems in young children other than torticollis, chiropractors indicated they consistently provide treatment for a musculoskeletal dysfunction. They provide treatment for health problems commonly perceived as being nonmusculoskeletal in nature, after ruling out contraindications and identifying a related musculoskeletal problem. This finding identifies the need for future research in which the accuracy of the belief that musculoskeletal dysfunctions can be located and treated in nonmusculoskeletal health problems should be tested. Chiropractors' belief in the appropriateness of assuming a secondary role in the treatment of controversial health problems, and their stated preference to treat musculoskeletal health problems needs to be tested, as well. One way to look at this would be to ask chiropractors whether they would participate in randomized controlled trials involving musculoskeletal problems, and if so, whether they would continue to treat these patients if the trial results turned out to be contrary to their current practice method.

Paediatricians are often concerned that chiropractic care may delay or prevent appropriate allopathic medical diagnosis and treatment (14), which is an issue that was also discussed by Lee et al (3). Both the high number of chiropractors referring to and preferring to provide concomitant care with allopathic practitioners, and the strong belief that for nonmusculoskeletal problems chiropractors assume a secondary role to physicians, addresses the concern that allopathic diagnosis and treatment will be delayed. These findings seem to imply that the risk of harm due to such a delay is not as high as is often believed. However, it is possible that a response effect occurred and that chiropractors' responses were affected by social desirability in completing the questionnaire. At any rate, these findings also imply that chiropractors are open to and willing to be partners with physicians in the Canadian health care system.

Due to the relatively low response rate (57%), which was similar to that (60%) found in the study by Lee et al (3), it is questionable whether the study findings can be generalized to the Alberta chiropractic population. In addition, the study was limited to one province. This limits the generalizability to larger populations (eg, the Canadian chiropractic population or chiropractors in other countries). Therefore, future research should assess these results for applicability to the larger population of chiropractors. This is true for both quantitative and qualitative results.

The present study is the first Canadian study to assess chiropractors' beliefs regarding the treatment of patients younger than 18 years of age. The study's findings can be used as baseline measures from which future research can be directed. The development and inclusion of the vignettes as a research tool allowed a consistent and standardized portrayal of health problems. This reduced the potential for variability among responses. The methods used to develop the vignettes, with the exclusion of health maintenance, proved to be effective. No concerns were raised with regard to the accuracy of the vignettes; therefore, it is assumed that the vignettes accurately reflect the health problems presented. Because the content of the vignettes appears to be accurate, they might also be useful in future research. Another strength was the collection of both quantitative and qualitative data. Both complemented each other, and no contradictions were identified.

CONCLUSIONS

The study results indicate that chiropractors are providing treatment to patients younger than 18 years of age. Although the majority of health problems managed tend

to be musculoskeletal in nature, chiropractors also treat health problems that are not commonly believed to be musculoskeletal in nature. The willingness of chiropractors to ensure necessary allopathic treatment appears to reflect the profession's thoroughness; however, bias could have played a role, and the results should be tested in future research. This study has made a solid beginning to determine the role that chiropractors play in the treatment of patients younger than 18 years of age. To ensure that the potential harm of inappropriately providing or withholding chiropractic treatment for this age group is avoided, additional studies in this area are essential.

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