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GUIDELINES FOR AUTHORS

JCCP JOURNAL OF CLINICAL CHIROPRACTIC PEDIATRICS

The *Journal of Clinical Chiropractic Pediatrics* welcomes original and scholarly manuscripts for peer-review and consideration for publication. Topics must pertain to the field of pediatrics which includes pregnancy and adolescence. Manuscripts should not have been published before or submitted to another publication.

The following will be considered:

Case Reports and Case Series – presentations of individual or groups of cases deemed to be of interest to the professional and scholarly community.

Pilot Studies or Hypothesis – papers which, while very broad, present with a clear hypotheses and suggest a foundation for future, in-depth studies.

Literature Reviews – studies of existing papers and books presented with the intention of supporting and encouraging new and continuing study.

Technical Descriptions – reports of new analytical/diagnostic tools for assessment and delivery of care. Controlled, Large Scale Studies – usually, but not necessarily, performed at a college or research facility. May be double-blinded.

Commentaries – presentations of opinion on trends within the profession or current events, pertaining to pediatric and adolescent chiropractic care.

Guidelines for submission

All manuscripts are accepted purely for consideration. They must be original works and should not be under consideration by any other journal or publisher at the time of submission. They must be accompanied by a TRANSFER OF COPYRIGHT form, signed by all authors and by the employer if the paper is the result of a "work for hire." It is understood that while the manuscript is under consideration it will not be sent to any other publication. In the case of multiple authors, a transmittal letter should designate one author as correspondent.

Manuscripts may be sent to editor at svallonedc@aol.com. Manuscript should be in document style MS Word (or compatible) and unformatted. PDFs will not be accepted.

The paper must include an abstract or summary. This abstract/summary should state the purpose of the paper (objective), procedures, methods, main findings (results) and principal conclusions. Also, any key words or phrases that will assist indexers should be provided.

References must be cited for all materials derived from the works of other people and previously published works. Reference numbers in superscript must be assigned in the order of citation in the paper.

Tables – Each table or figure should be on a separate page and not imbedded in the manuscript. If the table is from another publication, permission to publish must be granted and the publication acknowledged.

Photographs – Photographs may be in color or in grayscale and scanned at 300 dpi with sharp contrast. Patient photographs must have consent form signed by the individual or parent or guardian in the case of a minor.

Informed Consent – If the research/study involves experimental investigations performed on humans the manuscript must include a statement that informed consent was obtained from the individuals involved in the investigation.

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Acknowledgements – Any illustrations from other publications must be acknowledged. It is the author's responsibility to obtain written permission from the publisher and/or author for their use.

All manuscripts deemed appropriate for publication by the editor will be sent blind to at least two reviewers. If the manuscript is accepted, the author will be notified. If substantive changes are required, the paper will be returned to the author and the author must re-submit a clean copy of the revised manuscript. Author will be given a tentative date for publication if accepted. Manuscripts not accepted for publication will be returned to the author without comment.

Instructions to Authors – Summary

See *Uniform Requirements for Manuscripts Submitted to Biomedical Journals* for detailed information http://www.icmje.org/.

General formatting guidelines

- All submission components must be submitted electronically.
- Only manuscripts in English are accepted.
- Submit manuscripts as **Microsoft Word** documents.
- Use 1" margins on all sides
- Use Arial 12 point black font
- Capitalize only the first letter in the title, and any proper nouns.
- Do not justify text.
- Do not use column function
- Number all pages at bottom right.
- Double-space manuscript. Single-space references, tables or figure legends.
- Do not abbreviate words or terms the first time they are introduced; at that time, provide the abbreviation in parentheses and use it from that point forward.
- Number citations consecutively using superscripted Arabic numerals and place all references in a **Reference** section immediately at the end of your section.
- Run spell check and grammar check after completing the manuscript. Use American English spelling and units of measurement.

Submission Components

- ***JCCP* authorship form**—submit separately from manuscript. All authorship forms may be combined in a single PDF. Each author must complete this form, scan and return it electronically to the editor before the manuscript can be processed.
- ***JCCP* Patient (or Parent/Guardian) Permission to Publish Form**—one form for each case (1 for case report; multiple individual forms for case series) — all forms may be combined as a single PDF.
- **Permission to acknowledge forms:** All individuals named in the Acknowledgements section of the manuscript must sign a permission form. The corresponding author may use his or her own form, or use the one *JCCP* provides–submit separately from manuscript. All permission forms may be combined as a single PDF.
- **Cover letter**—submit as separate document, either Word or PDF.

The following items MUST be submitted as a Word document.

Cover letter—Explain why your manuscript is appropriate for *JCCP*.

Document— Each of the following should be on a separate page. Use page break function to separate page, not repeated line breaks to get to a new page.

- Title page
- Abstract
- Manuscript
- Acknowledgements
- References
- Tables
- Figures

Title page

- Title of article—ONLY CAPITALIZE FIRST LETTER OF FIRST WORD
- Running head (limited to 40 characters)
- Word count (excluding references, tables and figures)
- Number of tables
- Number of figures
- Authors
  - Name, with all degrees (do not include Bachelor's level degrees)
  - Current title/position and affiliation, including city, state and country
- Corresponding author
  - Name
  - Mailing address, phone, fax
  - E-mail address; provide alternative e-mail address if possible

Abstract—not to exceed 250 words. It may be structured or unstructured. Structured abstracts usually include the following sections: Purpose, Methods (include study design in this section), Results, Conclusion. For case reports and case series, see document, "Instructions for Case Reports and Case Series."

Manuscript Components

Manuscript length will vary with the type of article; in general, manuscripts are expected to be 1,500-3,000 words in length, excluding references, tables and figures. These may vary with the type of article. For case reports and case series, see, "Instructions for Case Reports and Case Series." In general, for manuscripts reporting research studies, the order of components is:

- Introduction: succinctly describe the relevant literature supporting the need for the study.
- Methods: describe the methods used to accomplish the study, in detail sufficient to allow the informed reader to evaluate their appropriateness.
- Results: present the results of the study, without interpretation.
- Discussion: describe limitations of the study; interpret results; compare results to those of other relevant studies; discuss value and implications of the study.
- Inclusion of appendices is discouraged.

Instructions to Authors – Summary

Tables
- Number tables consecutively in text, using Arabic numerals (1, 2, 3 etc.)
- Place each table on a separate page at the end of the section, immediately following the References section.
- Use "table" function in Word to construct tables; do NOT use tab or space keys to form columns and rows. Use table "normal" style to construct table. Do not insert vertical lines between columns; do not use grids. Place horizontal line under table title and at end of table, separating the table from any footnotes. You may place horizontal lines under headings in the table for clarity.
- Use footnotes to explain details at bottom of the table (below a horizontal line). Identify using either superscripted lower-case letters or standard footnote symbols (sequence: *,†, ‡, §, ||, ¶, **, ††). Sequence the footnotes in the order text is read–from left to right and then down.
- Use left-justification to align numbers in columns.

Figures
- Place figure title and legend on page with the figure.
- Figures must be submitted electronically. Acceptable file formats: DOC, JPG, PDF. Figures may be embedded at the end of the manuscript text file or loaded as separate files for submission purposes. Should not be imbedded within the manuscript text
- Hand-drawn illustrations are not acceptable.
- Provide documentation of permission for any figures that are not original.

Acknowledgements
Include a statement disclosing any funding support for the project or project personnel, or any other potential conflicts of interest. Acknowledge only individuals or organizations who provided input or resources to the project that were above and beyond their usual responsibilities. All individuals acknowledged must provide written permission to use their name; these permissions must accompany the manuscript at the time of submission (scan documents and submit electronically).

Reference format—examples
- *Journal article*: Jefferies LJ, Milanese SF, Grimmer-Somers KA. Epidemiology of adolescent spinal pain: A systematic overview. *Spine* 2007;32:2630-2637.
- Book: Task Force on Community Preventive Services. Guide to Community Preventive Services. New York: Oxford University Press; 2005.
- Website/webpages: Author. Title. Name of website. URL. Date of publication. Updated date (if applicable). Date accessed. Example: Fox F. Promoting and sustaining collaborative networks in pediatrics. Pew Research Center. http://www.pewinternet.org/2013/06/14/promoting-and-sustaining-collaborative-networks-in-pediatrics/. Published June 14, 2013. Accessed September 3, 2017.

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Number of figures:

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Current title/position and institution (if applicable)
City, State, Country

Corresponding Author
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Journal of Clinical Chiropractic Pediatrics Authorship Form

Each author must read and sign the statements on 1) authorship responsibility and contribution, 2) financial disclosure and conflict of interest, 3) copyright transfer. **The corresponding author must sign the Acknowledgement Statement** and email the completed form to Svallonedc@aol.com to initiate manuscript processing.

Manuscript title: _____

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• I certify that this submission represents original work, and that neither this submission nor a substantially similar one has been published or is under consideration for publication elsewhere in any medium (paper or electronic). I also affirm that this submission is not subject to copyright or any other rights except those of the current authors.

• I certify that if so requested by the editor, I will provide the data or cooperate in obtaining the data on which this submission is based, for review by the journal's designated representative(s).

• I agree that the corresponding author may represent me to review proofs and make other decisions regarding the submission. I have approved the submission.

• I certify that I meet the criteria for authorship, having made substantive contribution to the manuscript as indicated below (check all that apply).

___ Development of project concept or hypothesis
___ Study design and development of methodology
___ Project implementation
___ Data collection and management
___ Data analysis and interpretation of results
___ Literature search and review
___ Manuscript writing
___ Other (specify contribution)_____

2. Financial Disclosure and Conflict of Interest

I certify that all sources of extramural support of this submission, and the role of any funding agencies in the conduct of the study have been clearly described in the Acknowledgements section of the submission.

Check one of the following two statements:

❑ I certify that I have no financial interests, relationships or affiliations related to the project or materials addressed in the submission.

OR

❑ I certify that any potential conflicts of interest, including financial interests, relationships or affiliations related to this submission are disclosed in the Acknowledgements section of the manuscript.

3. Copyright Transfer

In consideration of the action of the *Journal of Clinical Chiropractic Pediatrics* in reviewing and editing this submission (including manuscripts, tables, figures and any supplemental documents), I hereby transfer, assign, or otherwise convey all copyright ownership including all rights and incidental thereto, exclusively to the *Journal of Clinical Chiropractic Pediatrics*.

I also understand that if the manuscript is not accepted for publication by the *Journal of Clinical Chiropractic Pediatrics* I will be notified and the transfer of copyright will be null and void.

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• All individuals who have made substantive contributions to the submission but who do not qualify as authors have been named, along with their specific contribution in the Acknowledgements.

• All individuals so named have provided me with their written permission to be named.

• If no Acknowledgement section is included in the submission, there are no other contributors to the manuscript.

_____	_____	_____
Corresponding Author Signature	e-mail address	date signed

Journal of Clinical Chiropractic Pediatrics

Patient Consent Form for Case Report

Print name:_____

If patient is a minor, print parent/guardian name: _____

I have read the information about me/minor and/or seen the photograph to be published.
I give my consent for this material to appear in a scientific journal.

I understand the following:
(1) My name/minor's name will not be attached to the material. The authors of the article will make every attempt to keep my identity/minor's identity anonymous. I understand, however, that they cannot guarantee complete anonymity. It is possible that someone, such as someone who works in this clinic or one of my relatives, might be able to identify me/minor.

(2) The material will only be published in a scientific journal.

(3) The material will not be used for advertising.

Signed:_____ Today's date: _____
(if patient is a minor, parent or guardian signs.)

Journal of Clinical Chiropractic Pediatrics

Permission to Acknowledge

I give my permission to be acknowledged in the manuscript,

_____

which is to be submitted to the *Journal of Clinical Chiropractic Pediatrics*.

_____ _____
Signature Date Signed

_____
Print Name

Instructions for Case Reports and Case Series

Abstract
The abstract should be 250 words or fewer. It may be either structured or unstructured. If structured, use the same sections as described below for the components of the report (Introduction, Case Presentation, Intervention and Outcomes, Discussion).

Case Report Components

• **Introduction**: State why this case is unusual or important.

• **Methods**: describe the search engine and key words used to review previously published literature on the subject

• **Case presentation**: Provide a brief summary of the patient's presenting demographics, other relevant characteristics, complaint(s) and related symptomatology.

• **Intervention and outcomes**: Describe the course of treatment, including frequency and duration, and summarize the patient's clinical outcomes, using recognized outcome measures if possible. Include whether informed consent was obtained and if there were any adverse events reported.

• **Discussion**: Succinctly state the important aspects of the case, in terms of its implications for patient care in general, or for specific patient populations or conditions. You may also compare/contrast the case to other cases in the published literature. Be cautious about overstating the importance/implications of your case.

Evidence-based Case Report Instructions

An Evidence-based Case Report (EBCR) is NOT the same as a traditional case report. The EBCR focuses on an answerable clinical question, how it was explored in the search, appraising the results and how it applies to the case, along with the integration of this information with the patient interaction. The final stage in this process is to audit the results.

These are the steps to include:[1,2]

• Brief summary of the chief complaint: 50-100 words

• Briefly describe the clinical case: 250-400 words

• Explain how you developed the clinical question: 200-300 words

• Explain your search for evidence (key words, databases used, number of articles retrieved): 50-100 words

• Evaluate the articles retrieved: critically appraise the evidence for validitiy and relevance: 200-300 words

• Describe how you made your clinical decision by applying these findings to the case, including how you considered and integrated the patient's preferences and values: 250-400 words

• Evaluate your performance: 50-100 words

1. Heneghan C, Badenoch D. *Evidence-based Medicine Toolkit*, 2nd ed. Oxford, UK: Blackwell Publishing, 2006. http://onlinelibrary.wiley.com/doi/10.1002/9780470750605.index/summary (download pdf of "all chapters" for free copy of the publication)

2. Jones-Harris AR. The evidence-based case report: a resource pack for chiropractors. *Clin Chiropr* 2003;6 73-84. (download for free from www.chiro.org/cases/FULL/Evidence-based_Case_Report.pdf)

Additional interesting articles to read about EBM and writing and EBCR:

Review an example of an EBCR at:
https://www-ncbi-nlm-nih-gov.uws.idm.oclc.org/pmc/articles/PMC1126937/pdf/302.pdf

Iran J Pediatr. 2010 Sep; 20(3): 261—268. Evidence Based Medicine in Pediatric Practice: Brief Review
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3446038/

J Can Chiropr Assoc. 2014 March; 58(1): 6—7. **Evidence-based case reports**
http://pubmedcentralcanada.ca/pmcc/articles/PMC3924510/

3 BMJ. Vol 7, Issue 3, 2002, **Evidence-Based Medicine in Practice: EBM Notebook**
http://ebm.bmj.com/content/7/3/68

Editorial

Imploring you, encouraging you and empowering you

As I sit and watch the snow falling here in the woods of Connecticut, I reflect on how we New Englanders have "had it easy" the last handful of winters. The sturdy (some might say stoic) and prepared nature of New Englanders has softened under the gentler hand of Mother Nature and this winter's storms have taken us by surprise again. Yes, schools are closed for the third day in a row! Imagine!

We as pediatric chiropractors need to reflect on the same potential to sit back and allow time to pass without maintaining our due diligence as to what is going on in our profession and the world. As some may have noticed, there have been no issues of the JCCP published for the last two years. I've asked myself "Why?" as I've poked, prodded and begged colleagues to share their research, experiences and knowledge with others by submitting a manuscript for consideration. There seems to be an alarming sense of ennui about the state of affairs both in chiropractic and in the world at large and an overwhelming "busy-ness" keeping everyone otherwise occupied.

I'm here to implore you, to encourage you and to empower you once again! We can't give up! We can't succumb to the temptation to sit back on our laurels and let someone else do the work for us.

Kudos to those of you in the field working diligently every day to keep our children healthy. Dr. Celeste Krawchuk and Amanda Hartman teamed up to share clinical tidbits about Witteveen-Kolk Syndrome in a three-year-old. We are often challenged to expand our knowledge base to understand how to best offer our skills to support our patients. How heartening would it be to find another colleague who has published information about your next challenging presentation? May you continue to learn and may your offices be your heart-space that sustains you as you care for those who enter your doors. May you receive the gifts each child brings you that will empower you to help the next child.

Kudos to those of you who leave their office and represent us in the halls where decisions are made about everything from our scope of practice to our inclusion in the national healthcare program and private insurance industry reimbursement. And to those who defend our rights and the rights of our patients to retain control of our health care choices.

Kudos to those in the field of education and research that are not only providing education on an undergraduate level but also participating in programs leading to a pediatric certifications and diplomate programs. There are now even several excellent opportunities to pursue a Master's Degree in pediatric chiropractic available in Europe, Australia and the United States.

Most recently, Dr. Lora Tanis, president of the ICA Council on Chiropractic Pediatrics has announced the latest opportunity for board certified graduates of the DICCP program as well as other interested students in a degree program associated with McTimoney College. As one of the editors of the JCCP, I am hoping this will be another group of enthusiastic candidates who will be invited to consider our journal as an outlet for their publications.

Many of JCCP's most prolific authors have been participants in the long standing stellar Master's program offered at AECC under the tutelage of one of our editors, Dr. Joyce Miller. In this issue, Dr. Sue Weber, an AECC graduate, authors an update on her previous paper on pediatric headaches. Dr. Aurélie Marchand another contributing author, graduated and is now pediatric faculty at AECC. Dr. Marchand continues Dr. Miller's tradition of encouraging her students to contribute to the well of knowledge the rest of us need to constantly drink from to satisfy our thirst for knowledge.

Another one of our editors, Dr. Cheryl Hawk, whose gift is to gather colleagues to work together from around the world, continues to pursue opportunities for research and publish retrospectives, surveys, reviews, clinical practice guidelines and research papers on topics pertaining to maternal health and chiropractic pediatrics. Dr. Hawk, at one time faculty of the ICA Post grad program, has encouraged and supported many of the faculty and graduates of the ICA Council on Pediatric Chiropractics Diplomate Program (DICCP), to publish valuable case reports and case series as well as knowledgeable commentaries.

I recently received a book to review written by Dr. André Saine and was enthralled with the compilation of clinical anecdotes of a less publicized but clinically effective technique that I could immediately relate to a number of children and their clinical pediatric presentations I had cared for in my own practice that failed to resolve under my care. You know, those cases that get under your skin and despite your best efforts a puzzle piece still seemed to be missing. Reading this tome revived my enthusiasm about broadening my own knowledge of available techniques, exploring new information and expanding my skill set (or finding another colleague with this skill set to refer to!) to serve these children whose parents recognize the tremendous service chiropractors can provide their children and their families on the path of their chosen healthcare journey. This book reminded me that we must stay open, curious and willing

to grow no matter how long we have been in practice. But this book, and my conversations with its author, Dr. André Saine, also reminded me how important it is for our community to raise the interest and support our schools and graduate programs with the funding to support research on techniques like BNS, which, like so many techniques, have vast clinical anecdotes to support them, but fall by the wayside when they are scrutinized for publishable data.

Journaling our efforts and submitting a manuscript for publication is one of the easiest way to support each other in our quest for knowledge and new experiences, ever honing our skills and developing our "innate" ability to listen, observe, palpate and examine, and assemble sometimes obvious and sometimes random pieces of information and come up with a plan to help our young patients reach their goals of optimal health by employing the skills we offer our patient in the form of a specific, effective adjustment. Dr. Joyce Miller's offering in this issue ("Writing for publication: helpful hints for clinicians to write for the *Journal Clinical Chiropractic Pediatrics*") can help guide you in organizing your material and writing a paper to submit.

We are the ones. We are the ones who can provide the unique perspective we bring to health care. It is my sincere hope that we will remain curious, motivated and committed to staying current, remaining active and productive and staying present when things are challenging.

Without remaining present, we may miss the giggles, jokes and gems that our delightful young patients bring to us in exchange for the guidance and support they know they will receive when they come to our offices!

"The work is to not let the burdens of the world close you.
The work is to not let the hardships of the world harden your heart.
The work is to not withdraw your care simply because life is difficult.
The work is to become gentler and more compassionate
despite the troubles plaguing the planet.
That is true strength, and that is what begins to turn the tides to love."

– Jack Kornfield

Writing for publication: helpful hints for clinicians to write for the *Journal Clinical Chiropractic Pediatrics*

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ABSTRACT

The *Journal of Clinical Chiropractic Pediatrics* (JCCP) was inaugurated in 1996 by the Pediatrics Council of the International Chiropractic Association with a goal to showcase the work of chiropractic clinicians, educators and researchers. An Editorial Board was established, and the project was headed by Maxine McMullen, Joan Fallon, Peter Fysh and Molly Rangnath. The journal has been published approximately twice yearly since. The *JCCP* is now under the current leadership of Sharon Vallone, Cheryl Hawk, and Joyce Miller, editors. The *JCCP* became Open Access in 2014, and thus, is accessible to readership everywhere in the world with no fees attached. Articles are contributed from around the world, making it an international review of the specific types of work being performed in many different countries. The purpose of this article was to present the background of the journal along with the processes for publication to a relevant audience that might wish to pursue generating articles for potential publication.

Key Words: *JCCP; Journal of Clinical Chiropractic Pediatrics*; chiropractic research; publishing.

Background and Purpose

A full 58% of chiropractors[1] (and 27% of chiropractic students[2]) state that they plan to do research and publish that research during their careers; yet only 2-6%[3] of chiropractors internationally accomplish their professed goal of publishing. Since all chiropractors have the education, ability and experience to do so, this would suggest that there are gaps in knowledge of the process that limit their success.[4,5] The purpose of this paper is to identify and fill in these gaps for the readership of this journal and provide a process for doing the research, writing the manuscript and submitting for publication in the *Journal of Chiropractic Clinical Pediatrics*. As an international peer-reviewed open access journal, it is provided with the express purpose for chiropractors to share their knowledge and clinical research in the arena of pediatrics.

Procedures

This project involved the discovery and gathering of data that depicted the history of the development of the *Journal Clinical Chiropractic Pediatrics* (*JCCP*) through informal interviews along with information available on the internet. The approach was more specific than scientific with personal and written accounts from Sharon Vallone and Peter Fysh. It was soon established that a major goal of the journal was to encourage practicing chiropractors to share their cases and knowledge with each other.[6] Similarly, the goal of this writing was to stimulate practitioners to publish clinical observations and therapeutic outcomes from practice that have so far gone unpublished.

The author's own practice and publication experience were called on to supply the readership with numerous examples in order to illuminate the types of articles that might be helpful for those wishing to consider publication. A brief history of some of the specific evidence base as a grounding for future work was also identified for presentation.

History of the JCCP

In 1995 the need was recognized for a peer-reviewed journal to showcase the work of the many chiropractic clinicians, educators and researchers dedicated to the advancement of quality pediatric and maternal care. The *Journal of Clinical Chiropractic Pediatrics* (*JCCP*) was inaugurated in 1996 by the Pediatrics Council of the International Chiropractic Association with a goal to showcase the work of chiropractic clinicians, educators and researchers. An Editorial Board of ten members was established, and the project was headed by Maxine McMullen, Joan Fallon, Peter Fysh and Molly Rangnath. Maxine McMullen was the editor of Vol 1 No 1 in January of 1996 and Peter Fysh was the editor of volume 1, No 2, published in April 1996.

Starting a journal is a daunting process (see Box 1) requiring dedication, collaboration and a clear vision, all of which were shared by their team. As an editor, Peter Fysh shared this opinion in a 1996 editorial, "The strength of this journal, as a vehicle for presenting high quality clinical information, is the responsibility of the editorial board. This journal, however, cannot make a significant contribution without the field doctor for it is the field practitioner who spends each

1. Identify the Gap: Determine the need the journal will meet.

2. Set Up an Editorial Board: Assemble a group of respected scientists in your field. They'll provide strategic direction, support, and credibility for your project

3. Build a Website: Create a website to host your journal. Purchase a domain name, find a web-hosting company, and prepare content.

4. Involve Associate Editors: These editors can offer additional support and expertise.

5. Call for Papers: Announce the journal's launch and invite researchers to submit their work.

6. Manage Submissions: Develop a system for handling manuscript submissions, including peer review, revisions, acceptance and rejection decisions.

7. Apply for an ISSN: Obtain an International Standard Serial Number (ISSN) for your journal. This is a unique identifier used for cataloging and indexing purposes.

Box 1. Some key steps to starting a journal

working day caring for children who must be the source of the information which we present. If chiropractic pediatrics is to make it into the main-stream of public health, we must be prepared to document our actions and so publicize the potential benefits to children's health available through the largely unrecognized option of pediatric spinal adjusting."[6]

1. Growth in Scholarly Activities: The annual rate of published contributions to the journal more than doubled compared to its first 11 years of publication. The proportion of original data reports also increased slightly.

2. Types of Articles: Controlled and quasi-controlled clinical trials were seven times more numerous during the studied period (28 articles).

3. Affiliations of Authors:
   - Chiropractic colleges were the most frequently mentioned affiliation of authors.
   - Collaborative articles submitted by authors at two or more chiropractic colleges increased significantly.
   - The National College of Chiropractic remained the most frequently mentioned academic affiliation.

4. Academic Backgrounds:
   - The number of articles contributed by individuals holding scientific (e.g., PhD) and medical degrees grew substantially.

5. Funding Sources:
   - The number of articles mentioning financial support increased.
   - The Foundation for Chiropractic Education and Research was the most frequently mentioned funding source.

6. Gender and International Contributions:
   - Approximately 21% of articles were authored or coauthored by women.
   - Of the 1050 articles, 27% were authored or coauthored by individuals residing outside the United States.

Box 2. Key findings by Pohlman, et al.[8]

In 2015, a brief history of the education of pediatric chiropractors was published in the journal.[7] "*JCCP* is committed to publishing research, scientific and professional papers, literature, chiropractic pediatric education reviews, case reports and clinical commentaries relevant to the health and treatment of the pregnant, postpartum and pediatric patient."[7]

The *Journal* has continued publication under the current leadership of Sharon Vallone, Cheryl Hawk, and Joyce Miller, editors. The *JCCP* became Open Access in 2014, and thus, is accessible for readership and contributions all over the world without any submission or subscription fees attached.

The *Journal* has met their goals as evidenced by a project outlining its' article types published in 2009.[8] Pohlman et al. conducted a bibliographic analysis of the 13 issues of the *JCCP* published between 1996 and 2007. As such, 72 articles were included in their analysis: 46% were case reports, 17% editorials, 13% case series, 10% narrative literature reviews, 10% commentaries, 4% "other," and 1% cross-sectional studies. Seventy-five percent of the authors were "private practitioners." A certification in chiropractic pediatrics was held by 43% of the authors; 65% of the authors were females, and 83% of the articles had a single author.[8]

Their conclusion was that there was room for improvement in the quality of the articles published. This study sheds light on the scholarly landscape within the chiropractic profession during that period and helps to reveal a growth in level of research published in the journal in that timeframe. Box 2 shows some of their key findings. It is suggested that such an analysis be conducted again to assess the scope of the JCCP's publications since that time.

Discussion

Having noted that fewer than 10% of clinicians actually publish work from their research or practice, what are the reasons? Bronston et al. in 2015, found in a survey of chiropractors that there were unmet educational needs for integrated practice and all of the scholarly activities that go with that type of practice (such as research).[1] There is no question that busy clinicians do research all day every day to answer their clinical questions. But this is not done in a systematic way and therefore doesn't necessarily lend itself to writing for publication. Organizing themselves to accomplish this is a burden few are willing to undertake. Certainly, there have been investigations into research priorities for specific chiropractors in specific areas. For example, Hayes, et al. in 2023, surveyed Quebec chiropractors and found that research priorities should focus on both MSK (musculoskeletal) and non-MSK conditions.[9] Interestingly, most of their advanced training came from the Quebec's Provincial College of Chiropractors

(OCQ) (50.4%) and from written articles (46.9%).[9] Hence, there is a heavy reliance on research journals for continuing education in practice. The survey did not include any queries as to whether the clinicians had made contributions to a research journal.

A systematic review[10] gave several reasons for lack of publication by researchers and clinicians, even after the research had been done: lack of time or low priority (median 33%), studies being incomplete (median 15%), study not done for the purpose of publication (median 14%), manuscript in preparation or under review (median 12%), unimportant or negative result (median 12%), poor study quality or design (median 11%), fear of rejection (median 12%), rejection by journals (median 6%), author or co-author problems (median 10%), and sponsor or funder problems (median 9%). The number one reason was that the studies were not even submitted for potential publication.[10]

International peer-reviewed chiropractic pediatric history and examination forms for the infant, child, and adolescent. *JCCP* 2023; 22 (1)

Maternal perceptions of a breastfeeding clinic: A protocol for service evaluation. *JCCP* Dec. 2020; 19 (2). 1683-1687.

Do probiotics benefit newborns and especially colic babies? A clinical opinion of evidence. *JCCP* 2020; 19(2)1694-1701.

Breastfeeding support team: when to add a chiropractor. *Clinical Lactation*, 2020;11(1).

Review of: Forces involved with labor and delivery–a biomechanical perspective. *JCCP* 2022;21(2).

Does breastfeeding lower the risk for childhood obesity? What is the evidence? *JCCP* 2018;17 (2) 1502-1506.

What is the evidence that chiropractic care helps sub-optimal breastfeeding? *JCCP* 2019; 18 (1), 1547-52.

Treating infants for suboptimal breastfeeding, is there a difference between chiropractic care versus multidisciplinary care: A pragmatic randomized comparison trial protocol *JCCP* 2019; 18(1):1552-57.

Using whole body vibration in the pediatric population: a primer for the chiropractor *JCCP* 2022; 21 (1)

Risks and rewards of early musculoskeletal assessment: an evidence-based case report. *British Journal of Midwifery* 2013;21(10), 34-54

Maternal report of outcomes of chiropractic care for infants. *JMPT* 2019; March-April, 167-176.

Chiropractic approach to the management of children. *Chiropractic and Osteopathy* 2010;18 (16)

Improvement in behavior and attention in a 7-year-old girl with ADHD receiving chiropractic care: A case report and review of the literature. *JCCP* 2019;18(1).

Box 3. Sample titles written by chiropractic pediatric practitioners

Considering that we are asking clinicians to actually write the article after completing all of the clinical aspects of the case, it is not surprising that their energy may be depleted and that the submission rate is low.

How can clinicians be served to help with this daunting task? Fortunately, there are researchers who have provided advice and step-by-step guidance for writing for publication

Bihrmann K, Pedersen MT, Hartvigsen J, Wodschow K, Ersbøll AK. Social inequity in chiropractic utilisation - a cross-sectional study in Denmark, 2010 and 2017. *Chiropr Man Therap*. 2024 Jul 15;32(1):27. doi: 10.1186/s12998-024-00548-x. PMID: 39010107.

Dolbec A, Doucet C, Pohlman KA, Sobczak S, Pagé I. Assessing adverse events associated with chiropractic care in preschool pediatric population: a feasibility study. *Chiropr Man Therap*. 2024 Mar 13;32(1):9. doi: 10.1186/s12998-024-00529-0. PMID: 38481318; PMCID: PMC10938841.

Keating G, Hawk C, Amorin-Woods L, Amorin-Woods D, Vallone S, Farabaugh R, Todd A, Ferrance R, Young J, O'Neill Bhogal S, Sexton H, Alevaki H, Miller J, Parkin-Smith G, Schielke A, Robinson A, Thompson R. Best Practice management of infants, children and adolescents by chiropractors: Results of a Delphi Consensus Process. *Journal of Integrative and Complementary Medicine*, 2023, pp. 1—17 Mary Ann Liebert, Inc. doi: 10.1089/jicm.2023.001.

Trager RJ, Dusek JA. Chiropractic case reports: a review and bibliometric analysis. *Chiropr Man Therap*. 2021 Apr 28;29(1):17. doi: 10.1186/s12998-021-00374-5. PMID: 33910610; PMCID: PMC8080364.

Keating G, Parent reports of chiropractic care for children: A preliminary report from 22,043 parents in Australia. *JCCP* 2021; 20 (1): 1731.

Holm LV, Jarbøl DE, Christensen HW, Søndergaard J, Hestbæk L. The effect of chiropractic care on infantile colic: results from a single-blind randomised controlled trial. *Chiropr Man Therap*. 2021 Apr 19;29(1):15. doi: 10.1186/s12998-021-00371-8. PMID: 33874955; PMCID: PMC8054384.

Mellars H, Durville J, Koel R, Laan A, Sandhauge K, Miller J. Parent reported outcomes of infant chiropractic care in a teaching clinic and private practices utilizing the United Kingdom Infant Questionnaire (UKIQ): A survey. *Journal of Clinical Chiropractic Pediatrics*. 19 (2), 2020. 1675-1682.

Miller, J. E., Hanson, H. A., Hiew, M., Lo Tiap Kwong, D. S., Mok, Z., & Tee, Y. H. (2019, Mar - Apr). Maternal Report of Outcomes of Chiropractic Care for Infants. *J Manipulative Physiol Ther*, 42(3), 167-176.

Pohlman KA, Carroll L, Tsuyuki RT, Hartling L, Vohra S. Active versus passive adverse event reporting after pediatric chiropractic manual therapy: study protocol for a cluster randomized controlled trial. *Trials*. 2017 Dec 1;18(1):575. doi: 10.1186/s13063-017-2301-0. PMID: 29191232

Box 4. Some relevant research articles for chiropractors serving pediatric patients

including the "credible case report."[11-24] More general advice has been given to help pave the road to publication.[25,26] The *JCCP* (as all journals) provides its own Guide for Authors, a six page compendium with complete instructions to help authors submit their articles. These Guidelines are available on the *JCCP* website.

As an editor, this author finds that these succinct and complete guidelines are often not followed. This should be the first step in producing an article for potential publication. Download the Guide for Authors (jccponline.com) and follow it meticulously. Feel no fear. You must take a backseat to no one. Your clinical care is well appreciated by your patients and their parents. Learn to ask delving questions to glean information from your patients.[27] You could follow in other chiropractors' footsteps (Box 3) and do a simple survey, asking patients about their rating of satisfaction of your clinical care,[28] or investigate the social inequities of the users of chiropractic practice[29] or other modern themes.[30]

There are numerous examples in the JCCP written by clinicians that one could emulate (Box 3). Research that has been done elsewhere could be duplicated within the clinical office and added to the knowledge base (Box 4).

Further, there are many examples of research into chiropractic care for children that provide some evidence and set the stage for further research and these could be reviewed at any time through this (and other) open-access journals.

The most common theme for a busy practitioner is to write about an intriguing case from practice. If you follow the recommendations from the many authors who have written "how to" guides for case reports,[11-24] your paper will be peer reviewed and guided through the system with a goal of publication.

Conclusion

Resources to assist you in your road to publication are plentiful. As an open access, peer reviewed journal, the *Journal Clinical Chiropractic Pediatrics* is a reasonable place to start your journey to authorship. Feel free to use the guidance that is willing and waiting for your work.

Editor's note: **Writing Case Reports – CARE case report guidelines**

An additional suggestion for the future authors is to utilize the CARE case report guidelines. They're accepted by many big journals such as *British Medical Journal* (BMJ) and makes it much easier to put together a case report because it provides you with a template and checklist to use. It is frequently used when teaching the pediatrics research seminar where students are required to write a case report, and for anyone who was thinking about writing one. Here's the link: https://www.care-statement.org/.

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Areas of professional development in chiropractic pediatrics. Beyond the adjustment

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ABSTRACT

Objective: This paper outlines the urgent necessity for the chiropractic profession to transition from a primary focus on spinal manipulation to a comprehensive model of pediatric care. This model integrates infant motor development, targeted pediatric rehabilitation, and vigilant adolescent sports injury management to solidify the chiropractor's role as a primary musculoskeletal specialist. **Methods:** By synthesizing current research in neurodevelopmental plasticity, sensorimotor integration, and global health standards, this framework identifies three critical pillars for professional growth:

1. Infant Neuro-Development: Emphasizing the achievement of sequential motor milestones and the use of objective assessment tools like the Alberta Infant Motor Scale (AIMS).
2. Pediatric Rehabilitation: Focusing on age-appropriate core activation and adherence to WHO guidelines for physical activity.
3. Sports Injury Vigilance: Prioritizing growth plate protection and ethical advocacy for the developing athlete.

Findings: Research suggests that persistent postural asymmetries, such as torticollis and plagiocephaly, can disrupt symmetrical afferent input during "critical periods" of brain development. This may lead to atypical functional lateralization and subsequent motor or visuo-spatial delays. Targeted clinical interventions and structured parent education are shown to counteract these imbalances, bridging the gap between clinical treatment and long-term developmental wellness. **Conclusion:** To secure its position within the primary care landscape, the chiropractic profession must prioritize continued research into manual therapy and functional rehabilitation for the pediatric population. By fostering symmetrical brain stimulation and advocating for the long-term well-being of the developing child over immediate performance outcomes, practitioners can significantly impact the trajectory of pediatric health and injury prevention.

To fulfill our role as primary musculoskeletal care specialists for the pediatric population, the chiropractic profession must urgently deepen its focus in several key areas, moving beyond basic spinal adjustment to comprehensive developmental care.

Chiropractors who care for children must elevate their competency to become experts in sequential motor milestone achievement. The infant's primary task in the first year is to develop core stability through a series of these sequential motor steps.[1] Our management strategies must reflect this by incorporating the Alberta Infant Motor Scale (AIMS) as a tool to assess motor development.[1] AIMS can also be used as a guide for training as well as the specific motor training techniques described by Kolar in Clinical Rehabilitation.[2] Clinically this has been shown to be effective in helping infants meet their motor milestones.[3]

- Understanding postural asymmetry: Practitioners must recognize how common findings like torticollis and positional plagiocephaly affect motor development and create unilateral stimulation and dominance.[1,4] This asymmetry impacts both efferent output and afferent input, potentially affecting motor development and brain hemisphere activation.[4] The following works support the concept that the infant brain's organization is highly susceptible to environmental and sensory input. Hench's work on critical periods emphasizes that early life is a window where sensory-driven activity is essential for setting up stable neural circuits, suggesting that asymmetrical input during this time could set up asymmetrical circuits.[5] Stile's work discusses how neural plasticity is a central feature of normal development, allowing the brain to be shaped by among other things, asymmetrical posture/sensory experience during the postnatal period.[6]

Vlaskamp's review links plagiocephaly with subtle delays in sensorimotor milestones, suggesting that the asymmetrical input is impacting the developing sensorimotor cortex and control pathways.[7] Korpela research focuses on the association between skull deformation caused by postural asymmetry and subtle motor and cognitive delays.[8] Eliks work describes how AIMS can be used as a tool to assess motor aspects of neurodevelopment in infancy and early childhood.[4]

Essentially, persistent asymmetrical sensory input during a critical period of development can reinforce, or fail to challenge, a pre-existing or temporary motor asymmetry, potentially contributing to atypical functional lateralization and resulting in motor or visuo-spatial delays.

The following references support the idea that atypical motor asymmetry, or the lack of symmetrical development, may be an early indicator of wider neurodevelopmental differences.[9,10]

• Effective Parent Education: A crucial skill is the ability to teach parents practical, age-appropriate exercises so they can actively work with the infant at home to counteract postural imbalances and promote symmetrical development. This bridges the gap between the clinical treatment and the infant's ongoing developmental needs.

2. Targeted Rehabilitation for Toddlers and Young Children

Management of toddlers and young children requires a targeted, yet engaging, approach to rehabilitation that aligns with global health initiatives[11]:

• Core Activation: Clinical focus should be on activating core muscles directly involved in the presenting problem. This requires a strong understanding of age-appropriate exercise modifications.

• Adherence to Global Health Standards: We must acknowledge and utilize guidelines, such as those implemented by the WHO for preschool motor skills, recognizing that our interventions influence activity levels and contribute to healthier weight profiles through childhood and adolescence.[11]

• Practical Instruction: To ensure compliance and success, practitioners must master the skill of introducing exercises to both the child and parent, often limiting instruction to one exercise at a time to prevent overload and ensure correct performance.

3. Vigilant and Responsible Sports Injury Management

In the arena of sports injury, particularly for the growing and developing child or adolescent, the profession must commit to heightened diagnostic and management vigilance:

• Recognition of Severity: We must overcome the tendency to underestimate the seriousness of injuries in young athletes. Injuries involving growth plates (physes) must be prioritized and require conservative management with basic core training as a priority.
• Appropriate Management: Growth plate injuries must not be managed aggressively to avoid further tissue damage. Rehabilitation requires core training to be implemented at a very basic level initially, slowly progressing only after healing is secure.[12,13]
• Ethical Advocacy: Practitioners have an ethical responsibility to protect the athlete's long-term health. This often involves navigating and pushing back against pressures from highly driven parents and coaches who may prioritize team victory over the athlete's safe and complete recovery.[14,15]

In closing, we cannot underestimate the importance of continued research focusing on manual therapy and rehabilitation for infants, children and adolescents to secure our position as primary care givers for this population. The impact of timely treatment and rehabilitation has been shown clinically, now we need to demonstrate these results on a larger scale. Age-appropriate rehabilitation where the core muscles are engaged is necessary for not only symmetrical brain stimulation but for injury rehabilitation.

Our work should extend from providing parents of infants, toddlers and children with preventive suggestions, appropriate milestone guidelines and therapeutic approaches to attain their goals as well as the inclusion of guidelines for coaches and parents to foster a supportive environment that prioritizes the developing athlete's long-term development, intrinsic motivation, and well-being over immediate performance outcomes.

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Pediatric Headache Master Intake Form

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Introduction: A modular system for pediatric headache evaluation was introduced in 2022 consisting of a separate questionnaire, history, and physical exam form.[1] While effective, the clinical landscape has evolved. The rise in recognized autonomic dysfunction, the persistence of regional neuroborreliosis, and the increasing prevalence of pressure-related pathologies in adolescents necessitate a more integrated approach. This updated 2-page Pediatric Headache Master Form consolidates those three instruments while expanding the diagnostic net for secondary headaches.

The Drive for Consolidation: Clinician efficiency is paramount. By merging three separate documents into one, the author has reduced "form fatigue" and ensures that the transition from patient-reported history to objective clinical exam is seamless. This consolidation ensures that critical links–such as the relationship between a toddler's "periodic syndrome" and a teenager's current migraine frequency–are not lost in fragmented paperwork.[2,3]

Expanding the Differential: Gravity and Pressure: The 2025 update places a heavy emphasis on "gravity-dependent" symptoms. Since 2021, our understanding of the following has become essential for the general pediatrician:

- **Orthostatic Headaches & CSF Dynamics**: The form now includes specific "time-to-relief" metrics to screen for Spontaneous Intracranial Hypotension (SIH) and CSF leaks.[4]
- **Adolescent Pressure Headaches**: There are added markers for Idiopathic Intracranial Hypertension (IIH), which is increasingly observed in the teenage population. The inclusion of pulsatile tinnitus and "whooshing" ear sounds serves as a critical red flag for this demographic.[5,6]
- POTS & Autonomic Integration: With the increased prevalence of Postural Orthostatic Tachycardia Syndrome (POTS), the form now mandates orthostatic vital signs, linking "coat-hanger" neck pain to autonomic instability.[7]

Infectious & Mechanical Updates: The master form addresses the "migratory" nature of pain–a hallmark of Neuroborreliosis (Lyme Disease). By asking about shifting joint pain and radiculoneuritis alongside the headache history, clinicians can better identify Bannwarth's Syndrome. Bannwarth's Syndrome, or lymphocytic meningoradiculitis, is a severe neurological form of Lyme disease, characterized by intense, radiating nerve pain (radiculopathy), cranial nerve palsies (especially facial), and inflammation in the cerebrospinal fluid (CSF). Furthermore, the author has integrated a postural screen (Upper Crossed Syndrome) to address the mechanical "tech neck" prevalent in school-aged children.[8]

Expanding the Migraine Spectrum: Hormones & Auras: The updated Master Form now accounts for the hormonal fluctuations of adolescence by including specific screening for menstrual migraines. Furthermore, the history section has been nuanced to differentiate between typical visual auras and more complex sensory or auditory hallucinations, ensuring a higher sensitivity for ICHD-3 classification.[9,10]

Neuromusculoskeletal & Mechanical Differentiation: To rule out mechanical triggers, the form now includes a targeted Neuromusculoskeletal Exam. This addresses the "tech-neck" epidemic by screening for:

- Upper Crossed Syndrome: Identifying the imbalance between tight pectorals/upper trapezius and weak deep neck flexors.[11]
- Cervicogenic Markers: Evaluating the upper cervical spine (C0-C3) for segmental dysfunction that frequently mimics or triggers primary headaches.[12]
- TMJ & Cranial Nerve Integrity: Ensuring that jaw dysfunction or subtle cranial nerve deficits aren't overlooked in the search for primary headache causes.[13]

Conclusion: While migraine and tension-type headaches remain the most common presentations, the "Master Form" ensures that the pediatrician is equipped to identify the pathological outliers. This tool provides a comprehensive, high-yield roadmap for the modern pediatric headache encounter.

Editor's note: The two-page Pediatric Headache Master Form found on the following pages, which can be downloaded and printed, can be obtained as a single form, 8.5 by 14, by clicking here, or following the link on the JCCP main web page.

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PEDIATRIC HEADACHE MASTER INTAKE FORM

Patient Name: _____ DOB: _____ Date: _____
Informant: [ ] Patient [ ] Parent/Guardian [ ] Both _____
Email addresses_____ Telephone number _____ [ ] Consent to treat

Health History
Medications _____ Illness _____ Surgeries _____ Diagnoses _____

I. Primary Headache Characteristics
- Frequency: _____ per month | Duration: _____ hours/days.
- Intensity (0-4): ____ Location: [ ] Frontal [ ] Behind eyes [ ] Unilateral [ ] Occipital
- Quality: [ ] Throbbing/Pulsing [ ] Sharp/Stabbing [ ] Dull/Pressure [ ] Migratory
- Relieving Factors: [ ] Sleep [ ] Dark/Quiet [ ] Medications: _____ Other_____
- ADL Impact: [ ] Sports [ ] Socializing [ ] Computer.
- School days missed/month:_____ Parental input_____

II. Positional & Pressure Triggers (The "Gravity" Screen)
- Time to pain onset after STANDING: [ ] Immediate [ ] 1—10 mins [ ] >30 mins
- Does the pain resolve almost instantly when LYING FLAT? [ ] Yes [ ] No
- Pulsatile Tinnitus: Do you hear a "whooshing" sound like your heartbeat? [ ] Yes [ ] No
- Does pain "spike" with Coughing / Sneezing / Straining / Stairs? [ ] Yes [ ] No

III. Infection & Lyme Screen (Neuroborreliosis)
- Migratory Headache Pain: [ ] Yes [ ] No [ ] Exposure to endemic areas
- Systemic Signs: [ ] Known tick bite [ ] Recent "Bullseye" rash [ ] Migratory joint pain
- Neurological: [ ] Shooting pains in limbs [ ] Facial drooping/weakness [ ] Stiff neck

IV. Biomechanical & Lifestyle Triggers
- Triggers: [ ] Screen time [ ] Reading/Studying [ ] Physical exertion [ ] Stress
- Screen Time: Weekdays: _____ hrs | Weekends: _____ hrs | Ergonomics_____
- Vision: Last eye exam: _____ Can you see the board clearly? [ ] Yes [ ] No
- Sitting Position in classroom:_____ Spinal pain (Neck)_____
- Activities of Daily Living Affected: [ ] School [ ] Social [ ] Sports [ ] Other_____
- Parental input_____

V. Periodic Syndromes & Early History (Migraine Equivalents)
- Infancy: [ ] Colic [ ] Paroxysmal Torticollis/ Vertigo [ ] Head banging [ ] Seeks dark room
- Childhood: [ ] Abdominal pain [ ] Cyclical vomiting [ ] Motion sickness [ ] Parasomnias
- Sleep: [ ] Bruxism (grinding) [ ] Night terrors [ ] Snoring/Apnea [ ] Nightmares

VI. Trauma History [ ]Concussion [ ]Whiplash [ ]Mouth/Dental Trauma [ ]Significant Falls

VII. Psychosocial & Neurodevelopmental
- Conditions: [ ] ADHD/ADD [ ] ASP [ ] Anxiety [ ] Depression
- Environment: [ ] Bullying [ ] Abuse [ ] Counseling/Therapy
- Stress: [ ] at Home [ ] in School [ ] Gender Identity

VIII. Family History [ ] Migraine _____ [ ] Tension-Type Headache _____

CLINICAL HEADACHE EXAMINATION (Provider Use Only)

1. Vitals & Autonomic

- BP/HR (Supine): _____ / _____ BP/HR (Standing 5-min): _____ / _____**
- Growth Curve: Ht: _____ % Wt:_____ HC:_____

2. Neuro-Musculo-Skeletal Examination

- Forward Head Posture [ ] Kyphosis & Upper Cross Syndrome [ ] Trigger points _____
- Lordosis / Scoliosis [ ] Torticollis / Plagiocephaly [ ] Laseue_____
- Spinal or Costovertebral dysfunction_____Flexion-Rotation Test _____
- TMJ: [ ]TMJ dysfunction[ ] Palpatory tenderness [ ]Grinding teeth [ ]Tongue scalloping

Neurological: [ ] CN exam_____[ ] Fundoscopy [ ] Babinski_____

- Visual Tracking: Smooth pursuit _____ Nystagmus _____ Accommodation _____
- Reflexes/Sensation/Strength _____ Gait _____
- Single Leg Stance (Eyes Open/Closed)_____ Romberg & Heel-to-Toe_____
- Meningeal signs: [ ] Kernig's [ ] Brudzinski's | Spinal ROM_____

3. Differential Diagnostic Impression

Vascular: [ ] Tinnitus/Dizziness [ ] Migraine with aura

Aura: [ ]Visual disturbances [ ]Feeling pins/needles [ ]Auditory hallucinations [ ]Osmophobia

Primary HA: [ ] Migraine without Aura [ ] TTH

Hormonal influence on headache_____

- CSF pressure: [ ] SIH (Leak) [ ] IIH (High Pressure) [ ] Chiari I
- Infectious: [ ] Neuroborreliosis (Lyme)
- Mechanical: [ ] Cervicogenic [ ] TMJ [ ] POTS

RED FLAGS REQUIRING IMMEDIATE IMAGING/ED REFERRAL

- Thunderclap Onset: Sudden "worst headache of life."
- Nocturnal Awakening: Waking up at night specifically to vomit.
- Focal Neuro Deficit: Cranial nerve palsy, ataxia, or papilledema.
- Age < 5 Years: Any persistent headache in a very young child.

** "BP Change >20mmHg or HR >40bpm = Positive Orthostatic Screen"

Barriers and facilitators to chiropractic pediatric practice

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ABSTRACT

Objective: To investigate the perceptions and experiences of South African chiropractors, with a special interest in the pediatric population, and to explore any barriers and/or facilitators experienced in their practices when caring for pediatric patients. **Methods:** Semi-structured interviews with purposive sampling were used to identify South African chiropractors with a declared interest in pediatrics. Eight participants were included in the study and data saturation was reached. The online private interviews utilized a semi-structured approach: collecting demographics, practice-based questions, followed by a 'grand tour' question and probing questions. The interviews were transcribed verbatim and then analysed according to the six phases of reflexive thematic analysis, whereby recurring themes were extracted from the data for interpretation. **Results:** This study identified new findings about the South African pediatric chiropractic profession. Four major themes were identified: chiropractors, parents and/or caregivers, healthcare professionals, and advertising and public awareness. The findings showed that most factors were considered as both facilitators and barriers and that, depending on how a practitioner utilized them, they could be dynamic and moldable. Findings suggest that increasing knowledge and awareness of pediatric chiropractic to other healthcare professionals and the public, establishing and building interprofessional relationships, and integrating into public healthcare would be useful. **Conclusion:** The findings show that barriers experienced may be manipulated into facilitators and that facilitators can be enhanced. These findings could assist practitioners, professional bodies, and institutions in addressing perceived barriers and developing pediatric practices.

Introduction

Chiropractic is sought out by parents for managing a variety of pediatric musculoskeletal and non-musculoskeletal conditions worldwide.[1-3] In this area of practice, current patterns identify a female predominance holding additional pediatric qualifications.[1,4,5] Referral patterns show variation including healthcare professionals (HCPs), family and/or word of mouth.[1,6] Adverse effects are rare and normally mild and temporary; however, further research is warranted.[7-9] Best practice recommendations[10] noted barriers and facilitators to chiropractic pediatric practice: patient communication, establishing trust with parents/caregivers, having cultural/religious/gender sensitivity, and developing interprofessional relationships. In adult chiropractic populations, finances, outcome expectations, lack of awareness, accessibility and knowledge were additional factors.[11] Other pediatric healthcare professions identified parental educational status, cultural and parental participation in physiotherapy[12], parental participation, trust, interprofessional collaboration, technology, policy, and education in nursing[13,14], and financial or lack of knowledge in multi-disciplinary practice.[15]

There is sparse literature exploring the South African context, with grey literature reporting a high volume of pediatric patients,[16,17] and chiropractors not holding an additional pediatric qualification due to lack of available and/or affordable opportunities.[16-18] But otherwise similar practice patterns to global chiropractic pediatric practice. African countries are typically low- to middle-income earning with their own cultural and context-specific issues having a unique impact on healthcare.[19] Pediatric chiropractic is currently developing in South Africa (SA) with practitioner lack of confidence and knowledge, collegial support, undergraduate education, parental satisfaction, patient-doctor communication,[18] knowledge and awareness from other HCPs, and interprofessional relationships[17] identified as barriers in the grey literature.

The National Health Insurance (NHI) will be progressively

implemented over 2024-2028 in SA. The NHI aims to become a single source of healthcare funds from which the government can purchase services from HCPs in both the public and private sectors.[20] However, chiropractic's stake in the NHI has yet to be confirmed, further highlighting the need for higher-quality evidence in pediatric chiropractic.

This study aimed to address a gap by investigating facilitators and barriers in a South African context, answering the research question: What are the barriers and facilitators encountered by South African pediatric chiropractors when caring for this population?

Methods

Design

An explorative, qualitative design,[21] grounded theory model,[22] and constructivist paradigm[23] were chosen for this study. The standards for reporting qualitative research (SRQR) were utilized in the development and reporting of this study.[24]

Researcher characteristics

The researcher is a chiropractor with previous interview-based qualitative research experience. All South African chiropractors with a pediatric special interest were invited to participate; it was attempted to include an equal number of participants from both South African universities where a Chiropractic Masters is offered to limit introduction bias. Assumptions prior to data collection, were that barriers and facilitators would be separate factors.

Context

Healthcare is regulated by the National Department of Health (NDoH), which consists of six health professional councils, with the Allied Health Professions Council of South Africa (AHPCSA) regulating chiropractors.[25] Chiropractic is delivered privately or via student learning clinics and is not considered an integral part of pediatric healthcare. Upon their application to the AHPCSA, chiropractors may elect to provide free services to the community in safe houses, a child service agency where abandoned or surrendered children are given to the state for care.[26]

In June 2024, there were 953 chiropractors registered with the AHPCSA.[27] The voluntary pediatric chiropractic association (Pediatric Chiropractic South Africa (PCSA)[28] held 167 PCSA members or 17.5% of the whole chiropractor population.

Sampling

Purposive sampling was used to identify participants based on their declared interest in pediatrics.[29] All members of PCSA were invited to participate, as well as chiropractors with a declared special interest in pediatrics.

Ethical considerations

Ethics approval was granted from the AECC University College Ethics Panel (AECC Ethics Approval Number: SOC - 0823 - 04). Participants gave informed consent to their data being processed, confidentiality was maintained and data was stored securely.

Data collection and analysis

A focus group (n=3) and pilot study (n=1) were conducted to ensure the validity and reliability of the interview guide (see Appendix A). Recruitment of potential participants was open between December 2023 and March 2024. A total of 174 potential participants were contacted, and follow-up reminders were sent. Sixteen expressed an interest in participating: One did not meet the inclusion criteria; six agreed to participate. After reminders, a further nine chiropractors responded, with two being included, two cancelling due to emergencies, and five no longer being available. In total, eight participants were interviewed. Data saturation was reached at the sixth interview, confirming data saturation.[30,31]

Semi-structured online interviews were recorded and transcribed as private meetings on Microsoft Teams (Microsoft Corp, Redmond, WA, USA); interviews were anonymised during transcription. To increase the credibility of data, reflective notes were made during the interviews and research process[32], data saturation was achieved[33], the six-phase process of reflexive thematic analysis was followed[34], and the interpretation was reviewed with another researcher to ensure accurate and reasonable interpretation.

Results

The mean age of participants was 34, ranging from 25 to 45. Six were female. They collectively held 66 years of experience (mean: 8.25, range: 1-20). They furthered their knowledge and/or skills by reading literature (n=7), attending seminars (n=5), enrolling in courses (n=5), searching journal databases (n=2), membership to PCSA (n=2), colleague interaction (n=1), and mentorships (n=1).

The anticipated themes of barriers and facilitators identified in the literature, did not emerge from the data, instead the reports of the participants showed blurred distinctions: "...I suppose a barrier and a facilitator [are] really just opposite sides of the same coin...". The results are therefore presented per themes instead of barriers and facilitators. A total of four themes on *chiropractors, parents/caregivers,* other *HCPs,* and *advertising* and *public awareness* emerged, with thirteen interrelated subthemes. Figure 1.1 shows the relationships between the themes and subthemes.

A. Chiropractor factors

A1. Consultation time

This was mostly identified as a barrier: appointment durations were longer, thus limiting the number of patients a practitioner saw each day. In addition, the unavailability of longer time slots for urgent and/or follow-up appointments acted as a deterrent for parents/caregivers. Practice opening hours were a barrier: "...I don't want to work 8 till 5, Monday to Friday...so that definitely is a barrier...[it] reduces my practice hours."

A2. Years of experience

Seven participants reported a postgraduate lack of confidence; "...I did not feel confident coming from university into practice and just treating peds..." Increased time in practice was a facilitator, directly resulting in more confidence and competence. Upskilling oneself was achieved by staying abreast of the literature and attending seminars/courses from both chiropractic and other pediatric fields: "...constant learning with webinars and courses... that's how I grow myself." Another barrier was skepticism from parents: "...the parents are a bit skeptical...that's something that's tough to deal with...And I think [it] can knock my confidence..." During the probing questions of the interviews, three participants reported utilizing mentorship; this was a symbiotic relationship with more experienced practitioners benefiting from practice growth and increased public awareness of pediatric chiropractic and the less experienced associate gaining experience under their guidance.

A3. Environment: the practice and the practitioner

The relatively cheap initial practice set-up costs were a facilitator; "I work with my hands...I don't have to have crazy equipment to be able to work." Three participants noted the practice environment needing to be pediatric-friendly and aesthetically pleasing, requiring additional expenses. Another key component of finances was location: "...in South Africa, there is such a gap between people who have the funds for accessing chiropractic care and then those who are on basic government healthcare..." When considering their own environment, having an innate passion for pediatric chiropractic showed the significance of the practitioners' mindset; "...if you really passionately love the thing that you're doing, I think that as an internal drive [it] is a major facilitator..."

A4. Specialization

Five participants felt that chiropractic sub-specialities should be considered; "I don't think everyone should be doing peds..." Additionally, participants noted negative experiences which had "...given a really bad taste in the mouth..." when parents/caregivers and HCPs had interactions with a chiropractor without additional pediatric education.

B. Parent/caregiver factors

B1. Knowledge

Parent/caregiver knowledge was essential throughout the consultation and through many media (in-person, social media, blogs, etc.). Several factors were reported as barriers: inability to communicate, volume of information delivered at a time, conflicting advice from different HCPs, and setting realistic treatment expectations. This sub-theme is also linked to B4, Trust/Fear, since a lack of knowledge could also cause fear.

B2. Financial

Finances were noted as a "big barrier...interesting to deal with and a luxury in South Africa." "Medical aid is another barrier...[patients will] use up these savings, [and then they won't return because] they don't have the medical aid [funds] or that's the way that they perceive it..." Finances also had an impact on care decisions: "...a lot of the time we undertreat because we're worried about what they can afford."

B3. Cultural

In some cultures, there is a lack of awareness of pediatric chiropractic and caregivers would not include it as standard pediatric healthcare: "...because it hasn't been part of their recent cultural upbringing, it's deemed to be different." However, if a practitioner displays cultural sensitivity, it can instil trust in caregivers, and even assist in building clientele: "…if you can show cultural sensitivity… [from those who weren't] expecting it, that will build your practice..." This highlighted the importance of cultural awareness: "... how different cultures interpret things like crying, diet changes, sleep, milestones...you're not seeing a child separate to their culture. You're seeing them within their culture, and you have to work around them."

B4. Trust/Fear

Seven chiropractors reported skepticism around safety: "Parents thinking that chiropractic is unsafe. Or [that] we're gonna hurt their baby..." This was typically addressed with education on pediatric chiropractic care, and general skill of handling parents/caregiver: "...it's not just handling the babies; [it's] handling the parents as well." Three chiropractors reported becoming a parent as a facilitator for trust building: "...I felt like I grew so much as a pediatric chiro when I had my own baby. I felt like it was a whole new world that I was now a part of..." However, being a parent was also recognised as a form of bias and a potential barrier: "...when you've had a baby...your experience is going to determine how you think, how you should speak to someone, what kind of information you should give...I think sometimes that can cloud things. So, it's a barrier, but I also think that it's a facilitator because I'm that neutral person..."

C. HCP factors

C1. Openness

All participants interacted with HCPs; however, some were interested in collaborating, and some were opposed. Participants directed their efforts towards those HCPs who were more open-minded and holistic practitioners (e.g.: doulas, midwives, lactation consultants). Younger and more open-minded HCPs were interested and allowed for the development of a relationship: "[There were] new pediatricians, so they're young [and] more open minded. I could set up a meeting with them...and then I set up that relationship." Some chiropractors unsuccessfully attempted to establish relationships with pediatricians and gynecologists; "...a lot of them didn't even want to come out of their offices to meet me." To remedy this, written referral letters and patient word of mouth were used to demonstrate knowledge and skill: "...when you have a chance to refer, write a good referral letter. Show the ped that you are knowledgeable [and] highly skilled...that builds trust and strengthens the relationship and the peds trust in us as a profession." "...tell your pediatrician that you've been here [and] what a good experience this was." However, this was not always met with success. Facilitating effective relationships with other HCPs remains an area of development for the profession.

C2. Knowledge

Participants reported a lack of awareness from other HCPs as a barrier: "...[they] don't get educated when they study medicine...on chiropractic and what we do...and what our role is in the whole of healthcare..." However, knowledge may also be a facilitator: "...those people who have been educated or have some experience of the benefit of chiropractic...they can be very strong advocates. So, it goes both ways."

C3. Interprofessional relationships

Upon opening a practice, establishing interprofessional relationships for future referral and co-management was reported: "...[I needed to] build a name for myself, introduce myself to the key players in the pediatric field...Anyone who's involved in the first few months of a baby's life, that's who I've needed to make connections with." Chiropractors assisted in aligning patient management, as differing advice from different HCPs could confuse parents/caregivers: "...patients hearing different things from different people...can be quite a challenge...differing opinions between practitioners." Referral from a trusted HCP assisted in dispelling skepticism about pediatric chiropractic from the parent/caregiver: "…a referral from those kinds of practitioners really makes parents believe in what you do because if it's coming from the doctor, it must be true..." Establishing professional relationships assisted in both interprofessional and public referrals: "...professional referral is the thing that really drives everything...I feel that the professional builds the public." Collaboration was helpful to busy pediatricians: "...pediatricians don't have time to talk about what's normal [and] what's not, what are the conservative ways to manage reflux? They don't have time for that..."

D. Advertising and public awareness

D1. Regulations and restrictions

Participants mentioned integrating pediatric chiropractic further into public HC: "...getting ourselves in the hospital setting or with the pediatricians and gynecologists...we should be a part of the primary healthcare..." Another participant proposed offering support to children who are cared for by the system as part of a chiropractic students' undergraduate training; "...when you're doing your clinic hours you can choose to go and do it at a safe house..."

D2. Marketing

Public awareness was low, in terms of pediatric chiropractic knowledge, and marketing regulations were considered a facilitating factor: "...I do think we're at the stage of life where people have access to so much information at their fingertips...", and with this ease of access to information chiropractors can "...educate people and the community on what chiropractors do and where we fit in in the health profession."

Discussion

The barriers and facilitators identified in SA chiropractic pediatric practice were *chiropractors, parents or caregivers, HCPs,* and *advertising and public awareness*. Participants reported barriers, which could be adapted and turned into facilitators. Some were consistent throughout a practitioner's career, such as regulations and restrictions, while others changed over time, such as advancing years of experience resulting in increased confidence.

On the theme of the *chiropractor*, the female predominance observed is aligned with previous local[16-18] and overseas[1,2] findings. Factors such as historical gender dominance or preference for child-carer therapeutic alliance[34] could be at play.

The subtheme of *education and practice information* was similar to the methods of furthering knowledge and/or skills, through journal reading and attending conferences and seminars,[35] previously identified locally. The lack of availability and high costs of attending conferences and seminars were also reported.[16-18] This lack of availability in pediatric training could also be due to the relatively new establishment of post-graduate chiropractic speciality programs.[8] Approximately a quarter of overseas pediatric chiropractors report additional formal training[1,36] and half of the participants in this study held additional pediatric training. Participants commended the advancements in post-graduate education yet felt that education could be improved in their undergraduate training.

Another sub-theme was the *increased consultation time* (for in-depth examination and patient education) needed, similarly to a local study.[18] Additionally, participants emphasized the importance of having a healthy work-life balance to protect from burnout by reducing working hours.[37]

The subtheme of *confidence* showed a bell-shaped curve in the development of confidence: recent graduates spend time on upskilling themselves whilst building a client base. They had time to see patients, yet due to a lack of confidence or experience or clientele, they did not. With increasing years of practice, the amount of time spent seeing patients rose. A plateau was reached mid-career when decisions relating to work-life balance were made. Thereafter, a progressive decline in clinical time was observed with advancing age. Towards the end of their careers, practitioners felt most equipped in terms of clinical experience to see patients but were less likely to see them due to decreased clinical time. It is proposed that mentorship at this stage could be most beneficial to recent graduates wanting to pursue pediatrics and to the overall profession.

The subtheme *lack of confidence* was reported as the biggest barrier for recent graduates. They did not rate themselves as highly competent at managing this population,[17] and would avoid treating this population due to lack of confidence;[16] which may result from a lack of knowledge and formal specialization in this area.[17] This was mitigated by corresponding with experienced pediatric colleagues. Another novel finding influencing confidence was skepticism and critique from parents. Some participants perceived this as ongoing critique of themselves and by extension, the chiropractic profession. They emphasized the need for mental toughness and thorough individualized education for the parents/caregivers to dispel concerns.

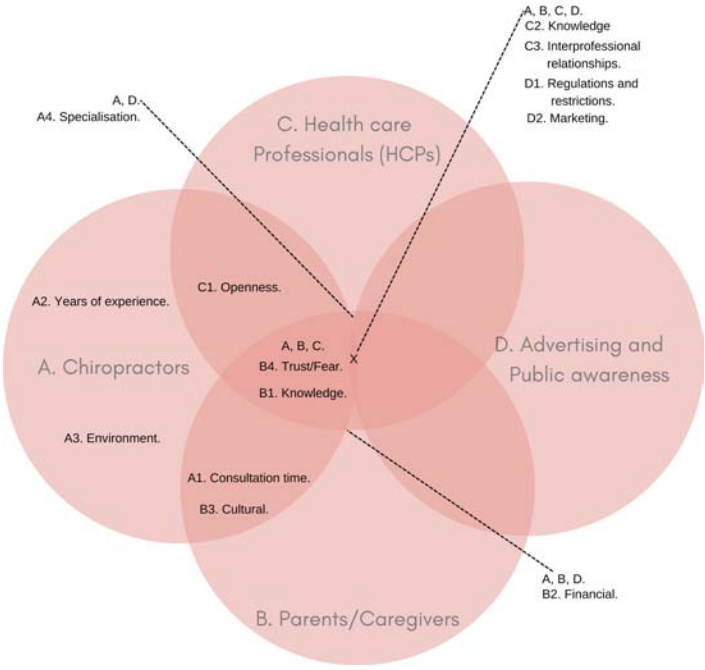

Figure 1.1 Barriers and facilitators to chiropractic pediatric practice

For the sub-theme *environment*, the expense of chiropractic care is not currently covered by the South African healthcare system. This financial barrier could limit chiropractic access to patients or prevent it all together. A SA chiropractor may need to consider the general affluence in an area when setting up. Additionally, Australian chiropractors reported location influencing pediatric chiropractic practice. When practising in remote and rural areas with limited healthcare, chiropractors may have to "extend" themselves to pediatrics to meet the needs of their population.[38]

Another subtheme identified was pediatric chiropractic as a *sub-speciality*. If applied, this could become a barrier and a facilitator in the future: generalist chiropractors would be barred from caring for this population without additional education, hence becoming a barrier. A facilitator of specialization would be that of formalized education being made accessible to the profession, which would produce more confident and competent pediatric chiropractors.

Education standards expect all qualified chiropractors to complete a simple pediatric assessment[10,39] and refer out where applicable.[1,39] Despite this, most participants felt disappointed in their undergraduate training. However, those with undergraduate pediatric exposure reported it as a facilitator to pediatric practice with increased confidence, competency, and igniting their passion for this population. This perceived educational need could be explored further by educational providers in SA. Currently, varied postgraduate pediatric chiropractic qualifications are offered in the United States;[40,41] United Kingdom;[42,43] South Africa,[44] and Australia.[45] Developing this in SA could lead to improved health outcomes for pediatrics and increased recognition for additional training.

For the theme *parents and caregivers*, chiropractors reported becoming increasingly responsible for their education about the condition when parents were less educated. This finding is similar to those in India, where unrealistic treatment expectations from less educated parents complicated interactions and served as barriers to effective management.[12] South African chiropractors, however, reported spending more time educating all parents of pediatric patients compared to adult patients, not only those with lower educational backgrounds. Furthermore, low-income families had a low adherence to treatment,[12] most likely due to the associated costs of repeated chiropractic visits.[18] Indeed, less affluent caregivers only utilized chiropractic when affordable and prioritised pediatricians instead, whereas higher incomes were facilitators to accessing pediatric chiropractic care.

In the cultural subtheme for parents/caregivers, HCPs needing to adapt and individualize management plans that ensure cultural acceptability.[46] For instance, in this study, a participant explained the importance of being culturally sensitive to the practice of baby-wearing on the mother's back, yet still providing medical advice around the concerns of hip dysplasia prevention. Therefore, not considering the parents' cultural beliefs can lead to decreased treatment compliance,[12] and act as a cultural barrier. Participants reported having adaptable and individualized management plans to ensure cultural acceptability, as previously reported.[46] Furthermore, in some South African cultures, a lack of awareness about pediatric chiropractic care may also lead caregivers to overlook it in healthcare in favor of culturally acceptable treatment methods. Indeed, a lack of awareness around pediatric chiropractic was reported by chiropractors with most parents/caregivers not including it as part of their child's HC. This is similar to other countries with limited use of chiropractic pediatrics.

Parent/caregiver education was utilized to address mistrust and concerns surrounding chiropractic care. *Trust* between practitioners and family members, as well as active family participation, positively influences a child's healthcare.[14] Participants reported that once trust was gained, it assisted in dispelling skepticism, encouraged word-of-mouth referrals and led to successful patient management.

Under the theme of *HCPs*, a lack of openness to engaging and co-managing with chiropractors was reported from most HCPs and pediatricians. The exception was the midwifery profession,[47] and those who had a personal experience with chiropractic, who were more willing to engage and develop professional relationships.

The limited *knowledge and awareness* of pediatric chiropractic by other HCPs, may be affected by the currently limited evidence supporting it, which was a subtheme barrier to interprofessional relationships. The safety concern of pediatric chiropractic was also most prominently reported in the interviews and compounded by the lack of evidence. Indeed, the current evidence in Australia[48] and other systematic reviews,[7,8] indicated no or inconclusive evidence over the efficacy of manual therapy in the pediatric population. Additionally, these reviews were critiqued on methodological flaws and the validity of their conclusions.[49] The scientific climate calls for more robust scientific evidence,[48] with funding and research required to produce higher-level studies both locally and globally.

Under the subtheme of *interprofessional referral and co-management*, current overseas referral patterns primarily show referrals from family and/or "word of mouth",[1,50,51] with some reporting rare interprofessional communication, or informing pediatric HCPs,[35,50] and a general trend of referrals to other HCPs rather than from.[8,52] In this study, most pediatric patients came from word of mouth, with pediatric HCPs having little or no knowledge of pediatric chiropractic. In Switzerland, where chiropractic is a government-recognized healthcare profession, chiropractors report receiving significant referrals from other HCPs,[53] showing how government policy may impact interprofessional relationships. When HCPs are knowledgeable of each other's scope, co-management is more effective.[10,17,47,54,55] Interprofessional practices involving chiropractors are at the early stages[54] with many barriers including professional mistrust, lack of interprofessional education, professional license and regulation, funding, policies and support being strongly in place. Improving awareness and understanding of chiropractic pediatrics among other HCPs was recognized as essential by participants.

In the last theme of *public awareness and regulation*, chiropractors felt that the public had limited access to the profession due to current healthcare policies not including chiropractic. Indeed, legislation plays a role as a financial and scope of practice barrier,[6] and promoting pediatric chiropractic at a public level can increase the exposure

of students and chiropractors to this population in South Africa.[18] When considering private healthcare routes, barriers were encountered through medical aid schemes, public and private funds being often depleted quickly.

Under the subtheme of *marketing*, social media can be a barrier to marketing due to public confusion.[38] However, in a South African context, the proper utilization of this tool could be beneficial by increasing awareness of pediatric chiropractic, educating the public and increasing the number of potential patients. Marketing guidelines for the profession have been identified as a barrier to awareness of pediatric chiropractic.[12] In this study, participants confirmed this barrier and highlighted the usefulness of social media. Strategies to further the public awareness that do not infringe on current guidelines should be investigated.

Limitations

The results may not be representative of the entire South African chiropractic profession, should be interpreted with caution and not generalized to the entire population. The sampling method was open to self-sampling and non-response biases. Despite the methodology employed, difficulties in interpreting questions or forgetting a noteworthy incident, might have impacted the data collected. The interviewer had some prior experience in qualitative interviews, which may be considered a limitation. Due to the pediatric chiropractic profession in South Africa being small, two participants were known to the interviewer.

Future recommendations from this study include further pediatric chiropractic undergraduate and postgraduate education being available and accessible to ensure practitioners are capable and confident in pediatric management. Mentorship opportunities in private pediatric chiropractic practice, and further research in the specific South African context would also be beneficial.

Conclusion

The South African pediatric chiropractic profession has commonalities and differences with chiropractic pediatric worldwide. Specific South African barriers and facilitators included the clinical environment in terms of the chiropractors, other HCPs, the financial and cultural factors concerning the caregivers, and the advertising and public awareness of the profession. The participants experienced many barriers, however barriers could be adapted and turned into facilitators. Some barriers/facilitators were consistent throughout a practitioners' career (e.g.: regulations and restrictions); some changed with time (e.g.: advancing years of experience resulting in increased confidence). These findings may be useful to support the future development practitioners, the professional bodies that represent them, and the institutions that educate them.

Appendix A: Interviewer guide

Education and Practice Information:

What is your age in years?
What is the gender group to which you feel most comfortable assigning yourself to?
In what year did you graduate?
How many years have you been in private practice?
How do you further your knowledge/skills in the field of pediatrics?

'Grand tour' question: "Please tell me about your journey on the setting up, growth and general running of a pediatric chiropractic practice in South Africa."

Probing questions:

Setting up

How did you come to develop your special interest in pediatrics?
How did your education prepare you for practice?
Did you have any pre-conceived barriers and/or facilitators prior to the set-up of your pediatric practice?
What would you say was the most significant barrier, in terms of setting up your pediatric practice?
How did you overcome your experienced barriers?
What would you say was the most significant facilitator, in terms of setting up your pediatric practice?
How did this benefit you in terms of setting up your pediatric practice?

Developing and Future

What are your current barriers/facilitators, in terms of the growth and/or stability of your pediatric practice today?
What would you say is the most significant barrier?
How do you intend to overcome it?
What would you say is the most significant facilitator?
How do you intend to use this to your benefit?
Do you foresee any other future barriers/facilitators?

Other factors (these probing questions are only to be explored if the participant hasn't mentioned them above or has but not in sufficient detail, according to the interviewer).

Patient and parent factors

Have you encountered any patient factors (e.g.: communication, feeding, response to treatment etc.) that have proven to be either a barrier or facilitator, in terms of your pediatric practice?
Have you encountered any parental factors (financial, cultural, geographical, economical, etc.) that have proven to be either a barrier or facilitator, in terms of your pediatric practice?

Accessibility factors

Do you find that your typical patient has knowledge of and can easily access your pediatric services?
Do you find that the general population has knowledge of and can easily access your pediatric services?
Are there any factors, in terms of knowledge and accessibility, that you think would greatly aid the establishment of a pediatric chiropractic practice?

Other health care professional factors

Do you utilise inter-professional referral in your pediatric practice? How did you establish these connections?
Do you encounter any barriers or facilitators by way of other health care professionals?
How do you overcome/utilise these factors?

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Chiropractic manipulative therapy with helmet therapy, association with treatment duration and cranial asymmetry outcomes for moderate to severe positional plagiocephaly: a retrospective cohort study

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ABSTRACT

Objectives: This study aimed to determine whether the inclusion of chiropractic manipulative therapy (CMT) during helmet therapy reduced the treatment duration and improved measurement outcomes for infants with moderate to severe positional plagiocephaly. **Methods:** This was a retrospective cohort study using clinical records from a South African orthotist. Infants aged 4—12 months with moderate to severe nonsynostotic plagiocephaly were divided into two groups: those who received helmet therapy alone (control) and those who received helmet therapy combined with CMT (intervention). The primary outcome was treatment duration (weeks); secondary outcomes included changes in cranial vault asymmetry (CVA) and cranial vault asymmetry index (CVAI), measured using SmartSoc® 3D scanning technology. **Results:** Of the 128 eligible infants, 61 families responded and gave consent, 24 infants met the inclusion criteria (12 control, 12 intervention). The mean treatment duration showed no significant difference between groups. However, the intervention group achieved significantly better cranial symmetry outcomes, with final CVA ($p = .010$) and CVAI ($p = 0.010$) values lower than the control group and more change for both CVA ($p = .755$) and CVAI ($p = .693$) than the control group. **Conclusions:** While the addition of CMT did not shorten the duration of helmet therapy, it was associated with superior cranial symmetry outcomes at discharge, potentially indicating more efficient symmetry correction. These findings suggest potential added value in combining CMT with helmet therapy in improving cranial symmetry. Further prospective studies with larger samples and standardized chiropractic protocols are warranted to confirm these preliminary observations.

Keywords: Chiropractic, manual therapy, plagiocephaly, helmet therapy, orthotic devices

Introduction

Positional plagiocephaly (PP) is an asymmetrical deformation of the infant skull resulting from prolonged external pressure on the pliable neonatal cranium, in the absence of craniosynostosis.[1,2] The condition is most commonly associated with prolonged supine positioning, often combined with positional head preference.[2,3] Additional risk factors include first-born status, multiple gestation, assisted or traumatic delivery, congenital muscular torticollis, intrauterine growth restriction, and insufficient prone ("tummy time") positioning.[3-5] Since the introduction of the "Back to Sleep" campaign in the early 1990s, the incidence of positional plagiocephaly has increased by an estimated 400—600%.[4,6,7,8] Current

prevalence estimates range from 20% to 40%, making it the most common positional cranial deformity in infancy.[9,10] This substantial rise has led some authors to describe PP as a growing public health concern or "pediatric epidemic".[11]

Clinically, positional plagiocephaly typically presents as a parallelogram-shaped head, characterized by unilateral occipital flattening, ipsilateral anterior ear displacement, frontal bossing on the same side, and contralateral parietal prominence.[2,9] More severe cranial asymmetries have been associated with longer-term consequences, including orthodontic abnormalities, mandibular asymmetry, and temporomandibular joint dysfunction.[3,12,13] Associations with delays in motor development, language, cognition, visual field restriction, malocclusion, and muscular dysfunction have also been reported.[3,12,13] Infants with cranial vault asymmetry (CVA) greater than 10 mm, classified as moderate to severe, demonstrate a significantly increased association with developmental delays.[14] These concerns highlight the importance of early and effective conservative management strategies.[15]

Conservative treatment options for PP include repositioning strategies, physiotherapy, massage therapy, manual therapy, and helmet therapy.[4] A recent systematic review by Blanco-Díaz et al.[15] concluded that pediatric physical therapy programs should be considered the primary initial intervention, and that the inclusion of manual therapy leads to superior improvements in cranial measurements compared to caregiver education alone.[9,16,17] Helmet therapy is considered a low-risk and effective intervention for moderate to severe plagiocephaly, particularly when conservative measures have failed.[2,6,10] Its effectiveness is strongly age-dependent, with optimal outcomes achieved when initiated before six months of age, although sufficient head and neck control is typically required.[2,6,11] Helmet therapy is generally recommended before twelve months of age due to diminishing cranial growth thereafter.[4,8]

While the concurrent use of physiotherapy or manual therapy alongside helmet therapy has been suggested in moderate to severe cases,[7,12] the literature remains unclear regarding the effectiveness of simultaneous treatment. To date, only one study has explicitly investigated concurrent manual therapy and helmet therapy, demonstrating a reduction in helmet treatment duration in severe plagiocephaly.[18] There is currently a lack of research examining the role of chiropractic manipulative therapy (CMT), adapted to the infant, as part of a combined treatment approach.

Manual therapy within the plagiocephaly literature primarily refers to physiotherapy or osteopathic interventions, with limited chiropractic-specific investigation.[3,4,6,9,15,16,18,19] Chiropractic care emphasizes manual therapy as part of a treatment protocol in pediatric populations.[20] In South Africa, chiropractors demonstrate positive engagement with evidence-based practice,[21] and parents commonly seek chiropractic care for infants, particularly for conditions such as torticollis and cranial asymmetry.[22] Despite this, chiropractic-specific reports for the treatment of plagiocephaly and higher quality research remains limited.

The aim of this study was to assess whether the addition of chiropractic manipulative therapy is associated with reduced helmet therapy duration and improved cranial measurement outcomes in infants with moderate to severe positional plagiocephaly. It was hypothesized that the inclusion of CMT alongside helmet therapy would result in shorter treatment duration and improved cranial asymmetry measurements compared to helmet therapy alone.

Methods

Study design and setting

A retrospective cohort study design was used to compare outcomes between infants who received helmet therapy alone and those who received helmet therapy combined with chiropractic manipulative therapy (CMT). This design was chosen as participants were grouped according to exposure status rather than outcome status. The study was reported in accordance with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement.[23]

The study was conducted using clinical records from a private orthotic practice in South Africa, where documentation routinely includes whether infants underwent chiropractic care during helmet therapy. This enabled comparison of helmet therapy duration between an exposed group (helmet therapy with CMT) and an unexposed control group (helmet therapy alone). Recruitment occurred over an eight-week period from March to May, 2025. Parents of eligible infants were contacted via telephonic messaging. Ethical approval was obtained from the Health Sciences University (United Kingdom; SOC-1024-009) and the Durban University of Technology (South Africa; IREC 006/25).

Participants and eligibility criteria

The orthotist screened records to identify infants who had received cranial orthoses specifically for nonsynostotic positional plagiocephaly, excluding other cranial deformities and craniosynostosis. Parents of 128 infants meeting these criteria were invited to participate. The invitation included study information, consent to access clinical records, and a request for infant demographic details.

Infants were eligible if helmet therapy was initiated between 4 and 12 months of age and if plagiocephaly severity was classified as moderate or severe based on cranial vault

asymmetry (CVA) and cranial vault asymmetry index (CVAI) criteria (Table 1). Infants outside the age range or with mild or normal asymmetry were excluded.

Severity classification	Crainial vault asymmetry (CVA) classification	Crainial vault asymmetry index (CVAI)
Normal	< 5mm	< 3.5%
Mild	5 — 10mm	3.5 — 6%
Moderate	10 — 15mm	6 — 10%
Severe	> 15mm	> 10%

Table 1: Severity classification of positional plagiocephaly adapted from Kim et al.[2]

Outcomes and variables

The primary outcome was duration of helmet therapy, measured in weeks from initiation to discharge as determined by the orthotist. Secondary outcomes included changes in CVA and CVAI from initial to final measurements. The exposure variable was receipt of CMT during the helmet therapy period. Participants were assigned to the control group if they received helmet therapy alone or to the intervention group if they received helmet therapy combined with CMT. Other variables considered as potential predictors included age at initiation of helmet therapy and initial severity of asymmetry. No formal interaction testing was conducted, and no data on adverse events were collected.

Data collection and measurements

Following informed consent, demographic data including date of birth and sex were collected from parent surveys. Measurement data and scan dates were obtained from the orthotist's clinical records. Helmet therapy duration, age at initiation, and age at discharge were calculated using these dates. All data were recorded on a standardized data extraction sheet prior to analysis. Cranial measurements were obtained using a SmartSoc® 3D scanner with Ebrace software, which calculates CVA and CVAI for each scan (Figure 1). CVA represents the difference between the two diagonal cranial measurements, while CVAI is calculated as CVA divided by the shorter diagonal length and multiplied by 100 to yield a percentage. CVAI allows for standardized comparison across infants with differing head sizes and was included alongside CVA as an outcome measure.[2,8,9,25]

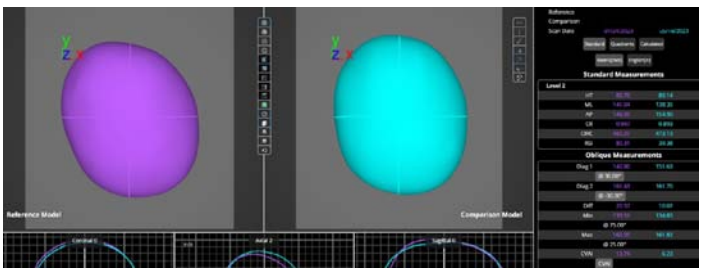

Figure 1: Comparison between initial (purple) and final (green) measurements collected from the orthotist, performed with SmartSoc® 3D scanner, and analysed on Ebrace software.

The SmartSoc® system permits infant movement during scanning and reports measurement accuracy to 0.01%, minimizing concerns regarding measurement error.[26] All cranial orthoses used were STARband® helmets manufactured under U.S. Food and Drug Administration regulation by Orthomerica.

Helmet therapy protocol

Helmet therapy followed a standardized orthotic protocol, including gradual daily increases in wear time to a maximum of 23 hours per day, with follow-up assessments every three to four weeks. Treatment cessation was determined by the orthotist when CVA was reduced to less than 6mm, typically within the normal severity range. Helmet therapy concluded earlier if treatment goals were achieved before 12 weeks or continued beyond this period if necessary. For this study, helmet therapy duration and changes in CVA and CVAI were compared between the control and intervention groups.

Sample size

A convenience sample was used due to the retrospective nature of the study and reliance on available clinical records from a single orthotic practice. Of the 128 infants who received helmet therapy for positional plagiocephaly, all cases meeting inclusion criteria and with complete data were included in the analysis.

Statistical analysis

Statistical analysis was conducted using IBM® SPSS® Statistics (version 30.0). Quantitative variables included age at initiation of helmet therapy, duration of helmet therapy (weeks), and cranial vault asymmetry (CVA) and cranial vault asymmetry index (CVAI) at initiation and discharge. Data distributions were assessed using the Kolmogorov—Smirnov test and were normally distributed. Descriptive statistics are reported as means with standard deviations. Group comparisons between the control and intervention groups were performed using independent samples t-tests. For each comparison, t statistics with degrees of freedom, 95% confidence intervals, and p values are reported. Statistical significance was set at $p < 0.05$. No subgroup or interaction analyses were performed. No missing data or loss to follow-up occurred.

Results

Participation and participant characteristics

Figure 2 illustrates participant flow and baseline characteristics. Of the 128 eligible infants, 61 parents (47.6%)

provided consent. Thirty-seven infants were excluded due to mild plagiocephaly, resulting in a final sample of 24 participants. The cohort included 13 males (54.2%) and 11 females (45.8%).

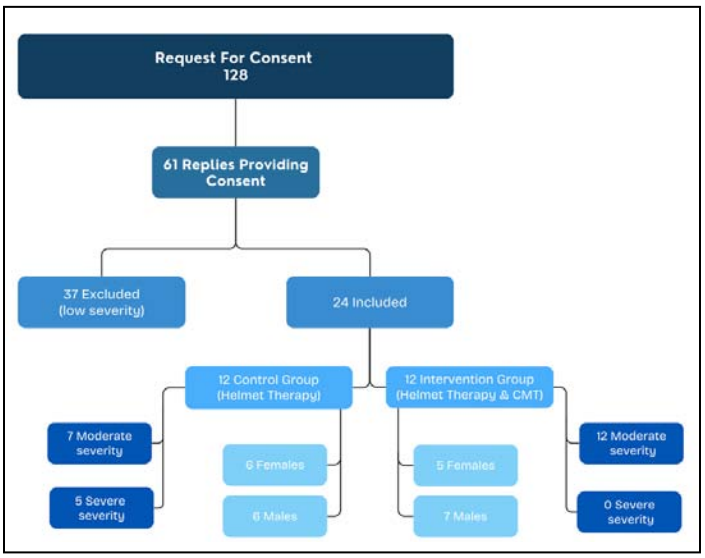

Figure 2: Flow diagram demonstrating recruitment, participation numbers, numbers of male and female participants per group and severity distribution between groups.

Twelve infants received helmet therapy alone (control group) and 12 received helmet therapy combined with chiropractic manipulative therapy (intervention group). The control group comprised 7 infants with moderate and 5 with severe plagiocephaly, while all infants in the intervention group presented with moderate severity at baseline. Sex distribution was balanced between groups, with 6 males and 6 females in the control group and 7 males and 5 females in the intervention group.

Baseline measures

The mean age at initiation of helmet therapy for the total sample was 6.00 months (SD = 1.60). Mean initiation age was 5.54 months (SD = 1.30) in the intervention group and 6.46 months (SD = 1.79) in the control group, with no statistically significant difference between groups (p = 0.166) (Table 2).

At initiation of therapy, mean cranial vault asymmetry (CVA) was 14.23 mm (SD = 3.08) in the control group and 12.06 mm (SD = 1.73) in the intervention group, representing a statistically significant difference (t(22) = 2.13, p = 0.045; 95% CI [0.05, 4.28]). Mean cranial vault asymmetry index (CVAI) at initiation was 9.59% (SD = 1.92) for the control group and 8.26% (SD = 0.92) for the intervention group, also demonstrating a statistically significant difference (t(22) = 2.16, p = 0.047; 95% CI [0.05, 2.60]). According to these means, both groups were classified within the moderate severity category at baseline, with the control group at the higher end of the moderate category range.

Treatment duration

Mean duration of helmet therapy for the total sample was 14.04 weeks (SD = 3.48). Mean duration was 13.92 weeks (SD = 3.68) in the control group and 14.17 weeks (SD = 3.43) in the intervention group. The difference in treatment duration between groups was not statistically significant (t(22) = —0.17, p = 0.865; 95% CI [—3.26, 2.76]) (Table 2).

Secondary outcomes

Pre- and post-treatment CVA and CVAI values for both groups are presented in Table 2. At discharge, mean CVA and CVAI values were lower in the intervention group compared to the control group. The intervention group demonstrated statistically significantly lower CVA and CVAI values at discharge relative to the control group.

Characteristics	Control Group (Helmet Only) Mean ± SD[a]	Intervention Group (Helmet + CMT)[b] Mean ± SD	t and p Values
Initiation age	6.46 ± 1.79	5.54 ± 1.30	t(22) = 1.43, p = 0.166
Duration (weeks)	13.92 ± 3.68	14.17 ± 3.43	t(22) = -0.17, p = 0.865
CVAc initial (mm)	14.23 ± 3.08	12.06 ± 1.73	t(22) = 2.13, p = 0.045
CVA end (mm)	6.04 ± 2.56	3.52 ± 1.74	t(22) = 2.83, p = 0.010
CVAId initial (%)	9.59 ± 1.92	8.26 ± 0.91	t(22) = 2.16, p = 0.047
CVAI end (%)	3.98 ± 1.63	2.37 ± 1.15	t(22) = 2.80, p = 0.010
CVA change (mm)	8.19 ± 3.29	8.54 ± 2.14	t(22) = -0.32, p = 0.755
CVAI change (%)	5.61 ± 2.14	5.90 ± 1.22	t(22) = -0.40, p = 0.693

Table 2: Demographics and clinical characteristics of participants in the control and intervention groups.

Changes in CVA and CVAI from initiation to discharge were greater in the intervention group compared to the control group; however, these differences in magnitude of change were not statistically significant.

Discussion

The primary aim of this study was to determine whether the inclusion of chiropractic manipulative therapy (CMT) during helmet therapy for moderate to severe positional plagiocephaly was associated with a reduction in orthotic treatment duration. The findings demonstrated no statistically significant difference in helmet therapy duration between the control group and the intervention group, with mean treatment durations of 13.92 weeks and 14.17 weeks, respectively. This suggests that the addition of CMT did not influence the overall length of helmet therapy. Despite the absence of a duration effect, differences were observed in cranial asymmetry outcomes. The intervention group demonstrated significantly lower mean CVA and CVAI values at discharge compared to the control group and achieved values within the normal severity category, whereas the control group remained within the mild category. Although the magnitude of change in CVA and CVAI was slightly greater in the combined therapy group, these differences were not statistically significant. These findings suggest that while CMT did not shorten helmet therapy duration, it may have contributed to improved cranial symmetry outcomes in this cohort.

The lack of significant treatment duration effect contrasts with a prior study reporting reduced helmet therapy duration when manual therapy was used concurrently.[18] However, that study employed a standardized manual therapy protocol and did not report objective cranial asymmetry measurements, limiting direct comparison. Helmet therapy duration is largely dependent on infant cranial growth rate and orthotist-defined treatment protocols,[2,8,25] factors that are unlikely to be directly influenced by CMT or other manual therapies. Additionally, the orthotist involved in this study adheres to a standardized protocol of approximately 12 weeks or longer, consistent with existing literature recommending a minimum of three months for effective correction.[2,10]

While CVA is commonly used in clinical practice, CVAI allows standardized comparison across infants with differing cranial sizes.[2,8,9,24] In this study, the intervention group demonstrated lower discharge CVA and CVAI values. Interpretation of these findings is limited by baseline differences, as the control group presented with significantly greater initial severity. Initial severity is a recognized predictor of helmet therapy outcomes, with less severe cases generally achieving lower residual asymmetry.[2,8,10,25] Conversely, some studies suggest that more severe cases may demonstrate greater absolute correction but often require longer treatment durations.[12,25] Given the mixed evidence, it remains unclear whether the improved discharge measurements observed in the intervention group were attributable to CMT or to lower baseline severity.

The mean age of helmet therapy initiation in this study was six months, which is within the commonly recommended therapeutic window of between 4 and 6-7 months.[1,2,6-8] Although earlier initiation is generally associated with greater rates of correction,[1,2,6,8,10] satisfactory outcomes have been reported when treatment begins before nine to ten months of age.[10] Importantly, no significant difference in initiation age was observed between groups, supporting comparability and reducing the likelihood of age acting as a confounding factor.

The sex distribution in this study reflects reported epidemiological trends, with a slight predominance of male infants.[1-3,8,9,12-16,18,22,27,29] Sex is generally considered a weak predictor of treatment outcome, and the balanced male-to-female ratio in this study supports generalizability across sexes.[9,12]

Helmet therapy is widely accepted as an effective intervention for moderate to severe positional plagiocephaly.[1,2,6,8-10,12,24,25] Debate remains regarding its use in mild to moderate cases, with some guidelines recommending conservative management prior to orthotic intervention.[5,6,9,12,17] The present study's sample group fell within the moderate severity range, which is the most debated category as it lies on the boundary of arguments both for and against helmet therapy. Both groups demonstrated significant improvement, supporting the effectiveness of helmet therapy in this population. Interpretation is limited by the absence of data regarding conservative therapies received prior to helmet initiation.

Although CMT did not influence treatment duration, improvements in cranial symmetry outcomes were observed. Within the South African context, chiropractic care is frequently accessed by parents for pediatric conditions.[21] A recent survey reported that approximately 36% of chiropractors in South Africa primarily focus on pediatric or family wellness practice.[21] Furthermore, Doucet et al.[22] identified torticollis and cranial asymmetries among the most commonly managed conditions by chiropractors treating children aged 0—23 months. Given that torticollis is a recognized risk factor for positional plagiocephaly,[3-5,27] chiropractors may be well positioned to contribute to interdisciplinary management alongside orthotists, pediatricians, and physiotherapists.

Potential mechanisms underlying the observed findings include improvements in cervical mobility, reduction of

muscular imbalance or torticollis, and facilitation of more symmetrical head positioning during periods of rapid cranial growth, as proposed in osteopathic and chiropractic literature.[9,13,16,18,29,30] While these mechanisms remain theoretical within the context of this study, they may help explain the improved discharge symmetry observed in the intervention group.

Several limitations must be acknowledged. The small sample size limits statistical power and increases the risk of Type II errors. The retrospective design restricted control over potential confounders, including initiation age, baseline severity of asymmetry, infant growth rate variability, parental compliance with helmet wear, and the absence of standardized documentation regarding chiropractic treatment protocols. These variables were not formally adjusted for in the analysis, which may limit interpretability of the findings. Data were derived from a single orthotic practice, which may further limit generalizability. Strengths of this study include the use of precise three-dimensional cranial measurements, clinically relevant inclusion criteria, equal group sizes, and balanced sex distribution.

Chiropractic-specific research on positional plagiocephaly remains limited. Existing studies have relied on less precise measurement methods, such as diagonal calipers or tape measures, which may compromise measurement validity.[29,30] This study contributes preliminary evidence using objective three-dimensional imaging and is among the first to examine CMT in conjunction with helmet therapy. Although no reduction in treatment duration was observed, the findings support further investigation into whether manual therapies may enhance cranial symmetry outcomes.

Future research should involve larger prospective studies or randomized controlled trials with standardized chiropractic protocols and multi-site recruitment. Such designs would improve statistical power, reduce confounding, and clarify the role of chiropractic manipulative therapy within interdisciplinary care models for positional plagiocephaly.

Conclusion

This study found that adding CMT during helmet therapy did not significantly reduce treatment duration but was associated with slight improvements in CVA and CVAI measurements of cranial asymmetry in this sample of patients presenting with positional plagiocephaly.

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Clinical Close-up: Witteveen-Kolk Syndrome in a Three-Year-Old

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Witteveen-Kolk Syndrome (WITKOS) is a rare genetic disorder that shows mutations in the SIN3A gene. It has been labeled as a neurodevelopmental syndrome and as of 2020, around 40 individuals with WITKOS have been identified with a 1:1 male to female ratio.[1] There are several ways that WITKOS may present, including intellectual disabilities (mild to moderate), developmental delays, short stature and dysmorphic facial features that may include a broad high forehead, long face, depressed nasal bridge, small mouth, malformed ears and a high palate.[1,2] The SIN3A gene is a switch receptor for micro deletions. These patients may present with latching and feeding difficulties, behavioral issues, hyperlaxity in the joints and hypotonicity of their muscles.[1]

The mother of the patient was under chiropractic care with the author throughout her pregnancy. The fetus was active and in the vertex position through the third trimester. Mom was treated the day she went into labor and her midwife, doula and chiropractor palpated the fetus in the vertex position, but during labor he flipped into a breech presentation. He was a breech delivery accomplished at home, but had a difficult time latching, so the chiropractor was asked to adjust him at 13 hours old. When first assessed, he presented with overall low muscle tone. His suck swallow breathe (SSB) synchrony was disorganized. Oral evaluation revealed that he had a high palate, a tongue tie and upper lip tie. His upper cervical spine (C1 and C2) and his sacrum were subluxated and his cranial bones were not moving freely at the temporals, sphenoid and occiput. In addition, his mandible was retracted. Fingertip pressure was applied to adjust C1, C2 and the sacrum and craniosacral technique was applied to release the listed cranial restrictions. He immediately latched more deeply and securely to breast feed. He was adjusted again two days later at the same vertebral levels and the same cranial bones. When breast feeding, per his mother, he would latch well, then would tire quickly, with his jaw/mandible dropping due to muscle fatigue. Adjustments and CST would help with this temporarily. At three days old he had his ties lasered by a pediatric dentist. He was able to latch but continued to have poor milk transfer. Mom continued to attempt breastfeeding, but ended up pumping and bottle feeding, while working on his latch.

Cayman at 36 months, demonstrating his elongated face.

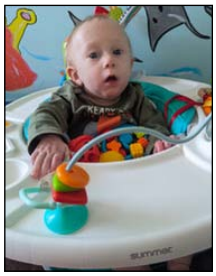
*Photograph is of Oakley (*Twin B) at 4 months demonstrating his high forehead and elongated face.*

With continued chiropractic care, physical therapy, occupational therapy, speech therapy and feeding therapy he has been steadily improving. (see mother's detailed account of obtaining a diagnosis of WITKOS). The patient is now three years old, walking, talking (but was delayed in speech development) and interacting appropriately for his age.

In June 2024, a set of twins were born to the same family and twin B presented with the same facial characteristics and feeding issues as his WITKOS brother and, upon evaluation, was given the same diagnosis. Twin A did not seem to carry the gene variation The author was able to adjust him within less than 10 hours of birth and found that he was also hypotonic, had a high palate and tired easily and quickly while breast feeding with a weak and insecure latch. After each adjustment and cranial session, his latch and feeding with a bottle would greatly improve for several days. The parents immediately enrolled him in speech, OT and PT, along with continued adjustments and his breastfeeding efficiency improved.

Cayman at 6 months, demonstrating his hyper-mobility and hyper-flexibility

Cayman at 12 months, demonstrating his high palate.



Cayman at 15 months, demonstrating his high forehead and dysmorphic facial features.

Mother's Story:

We knew from birth that Cayman was hypermobile and hypotonic. After my water broke during labor, he flipped into a breech position but was born safely at home. In the hours and days after birth we saw how his cheeks, arms, and legs were all low tone. As a lactation consultant, I started suck training right away and supplementing with expressed milk in syringes. Our chiropractor came to our house 13 hours after birth and adjusted him for the first time and we both noted his tongue tie, upper lip tie, and extremely high and narrow palate that ascending into his nasal cavity. At

three days old he had his ties lasered by a pediatric dentist. He was able to latch but continued to have poor milk transfer.

As the weeks went by, the most he would transfer at the breast was 1oz. After weeks of latching, pumping, and bottle feeding, I had a massive oversupply and chose to mostly pump for him and only latch on occasion. Latching was hard work for him and he needed cheek and chin support and he fatigued very easily. At eight weeks old, he had a three-day hospital stay for a UTI and while there, the pediatrician first heard his heart murmur. An echo led to a diagnosis of mild pulmonary artery stenosis and a tiny atrial septal defect. Both were very mild and would be monitored once a year. Cayman had an undescended testicle that was surgically repaired at one year old although both testes are still abnormally small. Cayman has always been small and below the first percentile for weight. His head and height are both below the 10th percentile. For the first year of his life, he met his developmental milestones on time.

Cayman did well with the introduction of purées but struggled with solid food. We started feeding therapy which lasted for six months. Around the same time, we also started speech therapy, occupational therapy, and physical therapy. Around two-and-one-half years old we started noticing absent seizures, predominantly at nighttime. Cayman didn't develop his pincer grasp until almost three years old and at three years old he is developmentally a two-year-old. He has over 100 words (expressive language) and is starting to combine words. His hypotonia makes him extra clumsy and he falls multiple times a day.

We started exploring genetic testing first with Cayman's older brother Malakai who is Autistic and has ADHD. Malakai has a deletion on the 15th chromosome and with Cayman's history we had him tested next. Cayman's genetic results came back with the same deletion on the 15th chromosome and a new variant of the SIN3A gene. When the genetics team first called with the results, they stated they had never seen it before in their own practice and there were only 30 documented cases in the world. Any variation of the SIN3A gene has been given the name Witteveen Kolk Syndrome. After being diagnosed, more tests were run and it was found that Cayman's growth hormone was low which matched his lack of progress.

There are now over 50 known cases and a Facebook group for Witteveen Kolk families. With such a rare syndrome we learn more about it from each other and bring that information back to each team of doctors.

Fast forward and now we have five-month-old twins. Twin B, Oakley, looks like Cayman's miniature clone. He's hypotonic which we again noticed at birth although he wasn't breech. He has the same facial features as Cayman. We immediately started physical therapy, occupational therapy, and speech therapy. His feeding journey has not been as complex as Cayman's was. For the first couple of months, he leaked large puddles of milk whether at the breast or being bottle fed. He needed suck training and both cheek and chin support when feeding. He transferred milk better than Cayman did, especially when tandem feeding with his twin sister. From months one to five, we gradually moved from more pumping and bottle feeding to mostly latching at the breast. He no longer leaks milk and transfers well. He is also tiny and below the first percentile for weight. He failed his newborn hearing screen and we learned through his ABR test that he has severe hearing loss in his right ear that requires a hearing aid. While Witteveen Kolk Syndrome doesn't present the exact same way in Cayman and Oakley, they both share many similarities with other Witteveen Kolk syndrome families.

Their father also has the same variant of the SIN3A gene and has a smaller stature and had developmental delays growing up. You can see similarities from the only study that exists for their syndrome here https://www.nature.com/articles/s41431-020-00769-7.

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Who Can Benefit from the Bilateral Nasal Specific Technique? A Clinical and Historical Perspective

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ABSTRACT

The term "bilateral nasal specific" (BNS) refers to a craniofacial manipulation technique in which insufflation of a small balloon is specifically performed in each of the three nasal meatuses on both sides. It is also known by many other names in the profession, including endonasal technique, endonasal cranial adjustment, balloon-assisted craniofacial adjusting technique, endonasal facial cranial release, cranial facial release, functional cranial release, Dr. Stober's technique and even "nose jobs."

KEYWORDS: chiropractic, pediatric, bilateral nasal specific, BNS, cranial manipulation, craniofacial manipulation, chiropractic history, Dr. Richard Stober.

Introduction: Reasons to be adept with the Bilateral Nasal Specific Technique.

The short answer to the question "Who can benefit from the Bilateral Nasal Specific Technique (BNS)" is anyone and everyone. With rare exceptions, most people would benefit from BNS because the issues for which it is primarily indicated are quite common in the general population.

For instance, to name some of the most common conditions, nearly half, 45 percent, of the general population suffers from post-concussion syndrome.[1] Symptoms typically appear within seven to ten days following the concussion and can persist for weeks, months, or even years or decades.[2] Approximately 3.6 percent of children five years and younger suffer from sufficiently severe concussions each year, requiring prompt attention.[3]

Up to 23 percent of all births in industrialized countries are assisted by instruments, which are linked to a 13 percent rise in attention-deficit/hyperactivity disorder in children who experienced instrumental delivery and a 53 percent increase in intellectual disability among those who had vacuum delivery.[4]

More than 16 percent of children are physically or mentally disabled.[5]

The prevalence of a deviated septum is found in about 20 percent of newborns and can be as high as 93 percent in older individuals.[6]

It has been estimated that up to 56 percent of children are mouth breathers,[7] which affects almost every function of the body and can lead to many adverse effects, including altered oral ecology, facial and head development, spinal and body posture load on the upper back and neck muscles, headaches, musculoskeletal pain, disordered sleep, lower physical and learning performance, cognitive problems, lower IQ, fatigue, irritability, depression, behavioral problems, asthma, chronic hypoxemia, increased water lost, decreased growth hormone release, shorter stature, increase inflammatory and oxidative mediators release, and more.[8]

Up to 38 percent of the population suffers from obstructive sleep apnea,[9] including four percent of children, which is associated with many medium- and long-term comorbidities, including reduced quality of life, daytime sleepiness, nighttime insomnia, hypertension, cardiovascular diseases, and a shorter lifespan.[10,11]

Eleven percent of children and adolescents have had a diagnosis of sleep-disordered breathing, which is associated with approximately a threefold increase in the subsequent incidence of neurobehavioral issues.[12]

About 40 percent of the general population suffers from allergic rhinitis,[13] 50 percent of children and teenagers have enlarged adenoids,[14] and 11 percent of schoolchildren have enlarged tonsils.[15]

It is estimated that 6.1 percent of the child population and 4.6 percent of the adult population in the United States suffer from Eustachian tube dysfunction.[16]

Up to 12 percent of the general population suffers from chronic sinusitis.[17]

Up to 30 percent of the adult population clench and grind their teeth chronically.[18]

Malocclusion is present in up to 93 percent of children and teenagers.[19]

Approximately 90 percent of the population has a limb-length discrepancy,[20] which is associated with low back pain and hip, knee, and foot pathology.[21]

Forward head posture is quite common, with a prevalence of approximately 66 percent.[22] As a result, individuals with forward head posture will tend to develop stooped shoulders or a slouched posture, winging of the scapulae, and increased thoracic curvature (kyphosis).[23] Forward head posture has been strongly associated with tension headaches, reduced neck mobility, neck pain, the severity of neck pain, and disability in both adults and older adults, as well as with the lifetime prevalence of neck pain and doctor visits for neck pain among adolescents.[24]

Up to 38 percent of the general population experience episodic tension headaches.[25]

Up to 87 percent of the general population suffers from neck pain.[26]

The common link among all the above conditions is that BNS should be considered a treatment of choice.

Based on the clinical experience of generations of BNS practitioners, the list of indications for the application of BNS encompasses more than 250 issues, including cognitive, IQ, mood, sleep, pituitary gland, TMJ, speech, and cranial nerve issues, as well as all forms of physical and mental disabilities, particularly in children.

Dr. Betty Radelet (1920-2016), DC, ND, an instructor in obstetrics, reported that the infants she assisted in delivering received four BNS treatments during their first month of life. She also reported that these infants rarely experienced the allergies and sinus problems of their parents. Chapter six of her book, *Anecdotes and Antidotes—Forty Years of Smiles and Tears in a Natural Health Clinic*, is titled "Nose jobs," in which she added, "These are lucky babies–the babies who receive this attention at birth."[27] BNS applied early may not only help prevent problems but also harmonize facial architecture.

However, the most common indication for BNS is head and facial trauma, which often can occur at birth for babies delivered vaginally and is even more pronounced for those delivered with the assistance of instruments such as forceps. The effects of head and facial trauma are cumulative over a lifetime. The more numerous and severe head and facial injuries are, the greater the impact on a person's overall health. Dr. Richard Stober, DC, ND, our BNS instructor, used to tell his patients that they were moving through life with their brakes on because of pressure from a tight skull on the central nervous system, whereas BNS relieved that pressure, allowing them to function fully.[28]

Any bodily and mental functions can be impacted by head and facial trauma, including energy levels, moods, cognition, sleep, pain, and endocrine, digestive, and immune functions. This explains the broad range and variety of conditions from which clinicians who practice BNS see patients improve under their care.

In general, the body cannot fully heal from head and facial trauma without assistance, which can result in numerous compensations that are less efficient and can have long-term ramifications. BNS treatments free individuals from the otherwise lifelong effects of these injuries. Most patients report experiencing a sense of freedom immediately after each treatment.

Furthermore, any facial asymmetry or uneven posture (e.g., one ear, shoulder, or iliac crest being lower than the other) could indicate the need for BNS. Patient's posture is corrected in a durable manner after BNS. In clinical practice, BNS practitioners report that the need for spinal manipulation decreases significantly once the cranium has been adjusted. Pain, tension, stiffness, range of motion, and related organ function in the rest of the body have been reported by patients to improve dramatically and durably immediately after a BNS treatment. This answers the question recently posed in this journal, "Why don't our adjustments 'hold'?"[29]

A good example is G.B., a 60-year-old wildlife biologist treated on October 11, 2024. He had been diagnosed with multiple sclerosis around 2005. He had numerous MRI scans over a 19-year period, which revealed accumulated sclerotic lesions along his ventricles. By 2010, he had lost control of his left arm and leg. He couldn't move his left toes and lost his ability to read. He made many lifestyle changes and self-treatment, which significantly improved his condition. For example, he followed a two-year raw, whole-foods-based diet. He presented with a wobbly gait, poor manual dexterity and many other health issues unrelated to multiple sclerosis.

He had experienced paralysis on the left side of his face since age seven, when the facial nerve was accidentally cut during an eardrum graft. He had experienced migraines about twice a month since age 12, which were linked to severe pain in his right upper cervical spine (12/10), causing him to crack his neck every 15-20 minutes during the day or 40-50 times daily. This cervical pain was so intense that he couldn't be touched, even lightly, without causing him extreme discomfort. He had chronic sinusitis with recurrent green post-nasal discharge for decades. He experienced several other, milder chronic ailments: sensitivity of his right cheek (5), pain of his right trapezius (7), low back pain (1), right iliac pain (5), right elbow pain (8), and bilateral TMJ pain (5-6).

After his first BNS treatment, the tender points on his head and face decreased from 15.5 to 8.5, representing a 45 percent improvement.

He returned three weeks later, with all his symptoms improved, including a new sensation that his face felt more relaxed. He reported feeling calmer, more alert, and generally more comfortable, with enhanced focus. He felt more rested on waking (from 2-3 to 6-7). He reported being able to do everyday tasks with his hands for the first time in about 20 years. He had more energy and endurance. He used to need to stretch his jaw about 30 times a day, which dropped to 2-4 after his fourth treatment. It was only after his sixth BNS treatment that he reported the brain fog he likely had for decades had progressively decreased from 8.5 to 1. He experienced only three migraines in nine months; each was linked to drinking too much alcohol.

After his ninth treatment, he reported that all his symptoms had continued to improve, and the progress was maintained between appointments. By then, he rarely needed to crack his neck, maybe once a week, or stretch his jaws. His neck was not sensitive anymore. He felt more stable and grounded on his feet. His gait had improved so much since his first treatment nine months ago that it now appears normal. The only remaining symptom by his twelfth treatment was the sensitivity of his right cheek, which decreased from 3 to 0.5 before and after that session. He reported that he was able to garden all day in the summer heat for the first time in decades.

It is interesting to note that as the pain in his right cervical area gradually subsided with each treatment, he asked whether his neck should be adjusted at some point. He was told that usually there is no need for that, since the bones of the head and face are being adjusted over time through BNS, most of the spinal pain, even in the lumbar area, including from herniated discs and spondylolisthesis, will tend to resolve without directly touching those regions, which was his case. In brief, all the pain, tension, and decreased range of motion of his neck that he had since childhood progressively disappeared without ever having to treat his neck, which illustrates how crucial the integrity of the cranium is for structural integrity and overall health.

In fact, restoring the integrity of the cranium is achieving what Dr. B.J. Palmer was seeking with his hole-in-one (HIO) technique, which is based on the working hypothesis that a precise adjustment to the atlas can influence the entire spine and nervous system. However, when compared side by side, BNS could outperform HIO because it is safer, more effective, and less expensive, as no X-rays are required. Additionally, it offers a more versatile, easier, and faster method of application from the newborn outward. We must be cautious when using X-rays, as recent estimates indicate that diagnostic X-rays account for approximately 10 percent of all pediatric and adolescent hematological malignancies.[30] It is crucial that physicians abide by "First of all, physicians do no harm," and diagnostic X-rays are used only when it is absolutely necessary.

Trauma to the head and face

As mentioned previously, the most obvious and common indication for BNS is trauma to the head and face. While some symptoms following an injury to the head or face begin to abate within hours or days after the incident, research suggests that even a single blow to the head can have severe consequences later in life. It has become increasingly recognized that the sequelae from head injuries are long-lasting, and a recent study reported that the incidence of dementia increased by 44 percent among people who had at least one incident.[31]

The data from studies on former American football players is staggering. A survey involving over 2,000 retired professional athletes found that those with a history of multiple concussions were three times more likely to be diagnosed with clinical depression.[32] Another study analyzing death certificates revealed that the death rate from neurodegenerative diseases was three times higher for professional football players than for the general population.[33]

It is also important to realize that the effects of trauma to the head and face are cumulative, including what might be considered at the time merely benign jolts and jars. People who have experienced concussions report that even simple jarring or jolting of the head, or a small impact, such as raising the head to pick something up and accidentally bumping into a lightweight lampshade, can significantly exacerbate their symptoms.[34]

Until controlled clinical research is conducted, we must rely on the extensive clinical experience of generations of BNS practitioners, which suggests that BNS may be the most effective method for treating patients with post-concussion symptoms. As a rule, most victims of at least a moderate concussion experience various combinations of symptoms immediately, including disorientation, blurry vision, dizziness, lack of balance, nausea, brain fog, and headache. These symptoms are soon followed by a decline in cognitive function, including poor concentration, memory, and thought processing. Furthermore, they may experience profound fatigue, requiring 10 or more hours of sleep per night for up to 18 months. Their sleep tends to be unrefreshing. Mood-wise, depression and apathy can dominate their lives. As a rule, their work and studies become greatly compromised. Many cannot look at screens without incurring consequences, such as increased headaches, fatigue, brain fog, or blurry vision. Many

patients feel that their quality of life has diminished after one or more concussions.[35]

Upon instituting insufflations during a BNS treatment, patients report hearing a crackling sound, and most patients immediately begin to feel some relief from their chronic concussion symptoms, including those that have persisted for decades.

It is important to recognize that conventional medicine offers very few options to ameliorate the symptoms that victims of concussions experience. Victims of concussions will often present who have been to some of the "top" concussion clinics in the world, where they were thoroughly examined by concussion specialists, including neurologists, neuroradiologists, orthopedists, physiatrists, physical therapists, neurovestibular experts, psychiatrists, and neuropsychologists. They are recommended various rehabilitation treatments and approaches, including behavior management methods, physical or exertional therapy, and appropriate return to aerobic and strength exercises. They are also prescribed medications for pain, nausea, mood, and sleep management. However, there exists a significant gap between thorough and sophisticated examinations of concussion victims and protocols that provide truly effective treatment resulting in recovery and or long-lasting relief.[36]

The goal of the physician is to heal the sick, not to perform extensive examinations or theorize. Extensive examination of concussion victims with minimal beneficial outcomes should be critically assessed, considering that highly effective therapeutic approaches are often overlooked or not utilized.

For example, at the end of December 2024, an American college linebacker[37] came in with post-concussion syndrome. He sustained a serious head injury during training camp in April 2021 and spent the next four days in intensive care. When he came out of it, the neurologist said, "No more football." He was then taken under the care of a specialized concussion clinic. He underwent thorough examinations, including scans, met with many specialists, and was prescribed medications and rehab exercises. However, he has not had a restful night of sleep since. He has been experiencing "focus" headaches every other day on average. He also experienced constant neck and back pain and stiffness. His girlfriend said he snored loudly and kept moving all night long.

A week after his first BNS treatment, he reported experiencing 80 percent deeper, more refreshing sleep. His sleep was no longer restless, and he had not had neck pain or a headache in the week following that first treatment. His energy and stamina significantly improved. The only remaining symptom was the constant dorsal pain, which had decreased from 4-5 to 1. His girlfriend also reported, "It's amazing, as he barely snores now and sleeps peacefully." Furthermore, his posture improved significantly after the first treatment and was normalized by the second. At his initial exam, he showed the usual reduced peripheral vision common among concussed individuals, which fully returned to full visual field after the first treatment. Of eight tender points on his face and head examined for sensitivity, he scored 35 out of 80, dropped to 19 after his first treatment, and to two after his second. Lastly, before treatment, he had been experiencing chronic bilateral nasal obstruction caused by accumulated facial injuries. After his first treatment, airflow improved from 3 to 9 on the left side and from 5-6 to 9 on the right side.

The above case is typical of individuals with a concussion. They tend to receive quite thorough examinations from conventional medical care, including scans and consultations with numerous concussion specialists, but are only marginally improved through conventional treatment, as the lasting structural effects of the injuries are either very rarely or not addressed at all.

Frequency of facial and head trauma in a person's life

Almost every child has experienced at least one head or facial injury severe enough to affect brain function and overall physical habitus, such as causing facial asymmetry and a crooked posture. Facial trauma can also encompass forceful dental procedures and any alterations that disrupt the bite.

However, regarding more severe injuries, such as those necessitating immediate medical interventions, a recent study reported that the annual number of sports-related concussions is closer to 3.8 million in the US alone.[38]

The incidence of milder head and facial injuries, not severe enough to prompt a consultation with a healthcare provider but substantial enough to produce cumulative negative effects on health and well-being, is much higher. Recently, an osteopath, a mother of two girls, was interviewed by the author. She mentioned that her children would sustain head injuries severe enough to necessitate cranial treatment at least once or twice a year during the first five years of their lives. On the same day, a family sought BNS treatment with three young children, aged 14 months, 3 years, and 4 ½ years. The same question was asked of these parents, who live on a farm, and they quickly replied that their children hit their heads almost every day.

Later that day, a man in his early fifties stated that he had played many sports when he was younger, particularly soccer, which he still plays. When asked how many times he had headed the soccer ball in his life, he answered,

"Millions of times." Of course, it is an exaggeration, as, on average, a soccer player experiences up to 1,000 intentional and unintentional head impacts per year.[39] And upon examination, this man displayed the posture of someone who had suffered the cumulative effects of numerous concussions. The positive response he reported immediately following his first BNS treatment was remarkable, particularly with respect to his posture, peripheral vision, and the tender points on his head and face, which decreased from 27/80 to 4/80.

There is emerging evidence that repeated sub-concussive head impacts can have cumulative, concussive-like effects on brain health. Sub-concussive impacts that do not result in clinical signs or symptoms of concussion are quite common, especially during contact sports, and are speculated to lead to alterations in cerebral structure and function later in life. When the legendary British soccer player Jeffrey Astle died at 59 after a five-year history of diminishing mental ability, concerns were raised that the repeated impact forces involved in heading a soccer ball may lead to unrecognized injuries. At autopsy, extensive degenerative brain disease consistent with chronic traumatic encephalopathy was found, leading the coroner to conclude that minor repetitive trauma was the cause of his death.[40]

A case illustrating the frequency of head injuries in young children and how BNS can transform their lives is that of A.C-K., a 6-year-old boy, first presenting on March 5, 2024. His parents listed six main complaints during his initial visit: 1) poor concentration and lack of focus, 2) poor balance and coordination, 3) recurrent headaches, 4) poor digestion, 5) nightmares once or twice a week, and 6) poor sleep. He has experienced three to four notable head injuries from hits and falls. After his first BNS treatment, his posture improved by about 70 percent. When they returned for his second treatment six weeks later, they reported that he had fallen on the back of his head two weeks earlier. However, they also noted that his concentration had significantly improved; he had not experienced a headache, and his sleep had become deeper, with less waking, occurring only every few days instead of every two hours. After his third BNS treatment, his posture was further improved, and he had no tenderness at any of the eight points on his head. However, they returned on February 6, 2025, after he fell on his occiput at the end of December, following which he experienced vertigo, nausea, and vomiting. Despite this, last fall it was reported that his overall focus had improved by approximately 60 percent, that he had no headaches or nightmares, and that his balance, coordination, and digestion had significantly improved. Additionally, they noted that he performed better in school.

The case of his 4-year-old brother is relevant to report because he was born with a misshapen head and torticollis. During labor, his mother was told to push even though she was not fully dilated. Since birth, it would take him three hours to fall asleep each night, and he would have nightmares with vociferation nearly every night. His posture was very crooked. After his first BNS treatment on June 27, 2024, his posture was nearly normal. He was falling asleep within 45 minutes. Four days after his second treatment on July 22, 2024, he injured his head and remained unwell until he returned three months later, on October 25, 2024. At that time, he was waking every night at 2 a.m. with a nightmare. However, it now took him only 20 minutes to fall asleep, and his sleep was deeper. When he returned for his fourth BNS treatment on March 3, 2025, his parents reported that he was waking only every second or third night, and his nightmares occurred only every two weeks. I last saw him for his fifth treatment on October 28, 2025. It was then taking him five minutes to fall asleep. He was still waking up every other night but was soon falling back to sleep on his own. He was rarely talking in his sleep, had no nightmares, and headaches were only occasional.

The most interesting part of this story about these brothers is that when they first presented to the clinic for the evaluation of the younger brother, the older brother slipped into the treatment room and lay down on the table. When we all entered the room, A.C-K. was told that it was not his turn to be treated, but rather, it was his younger brother's turn. He insisted he wanted to be treated. After his parents explained that he didn't need treatment, he continued to insist that he was the one to be treated, and his father had to remove him from the table. A.C-K appeared to innately recognize that he, too, required treatment.

It is also noteworthy to report that although the treatment is uncomfortable, it is not unusual for children to come voluntarily after the second or third treatment, as they know how well they feel afterward.

BNS in children

BNS can change children's lives, not only the ones who have had head or facial trauma, but also the ones with disabilities. For instance, in 1991, I began treating a three-month-old baby with Down syndrome. Before treatment, his mouth was open, as with all mouth breathers; he had a dull facial expression and showed little interest in what was happening around him.

As soon as he received a BNS treatment, his mouth closed, his eyes brightened, and he became alert. These benefits lasted for several weeks post-treatment. Over the years, it was easy to tell when he relapsed, as his mouth would open, his expression would become dull, and he would lose his coordination and any interest in learning. His parents would then bring him back for another BNS treatment. He was seen approximately five to six times per year until he

entered primary school at age 5.5, when he advanced to second grade because he could read and write and had no intellectual disability.

However, one of the most notable cases was that of David Jones, who was born in 1975 with cerebral palsy. His parents were told he would never talk or walk and would live the rest of his life with severe mental disabilities. He received BNS treatment from Dr. Stober as an infant and later developed speech and the ability to walk. He holds two college bachelor's degrees and an MBA. He is employed full-time and plays drums and guitar, and sings in the band he formed. In 2006, he wrote a 137-page digital paper to share information about BNS. This paper, *Bilateral Nasal Specific—A Patient's Perspective*, was available on his website, which was dedicated solely to BNS, until a few years ago. We could then read: "This site was developed to assist and provide resource information to those who seek assistance and as a means of improving their quality of life."[41]

History of the bilateral nasal specific technique

A significant portion of the history of the development of bilateral nasal specific will remain unclear, as those who could have provided details have now passed away. Nevertheless, the author has endeavored to compile a variety of facts about its past.[42]

In the early twentieth century, physicians from the Philadelphia-based Neuropathic School[43] were inserting their fifth finger into patients' noses to adjust the accessible bones of the face and head through the nose.

In his 1921 book, *Chiropractic Analysis of Chiropractic Principles as Applied to Pathology, Relatology, Symptomology and Diagnosis*, Dr. Willard Carver mentioned the use of a probe inside the nose to correct septal deviations, as such conditions could lead to problems with the throat and eyes: "The nose is frequently distorted and should have corrective attention. Here, the force can only be applied by use of the thumbs and fingers, and it is sometimes necessary to use such auxiliaries as flattened hard rubber levers, which may be placed within the nostrils against the wing cartilages in order that gentle pressure may be directed upon these structures, as well as the nasal bones, and the septum. It is not well known among chiropractors, but it is true that distortions of the nose are frequently responsible for many adverse situations of the throat and eyes, and in such conditions, it is very essential that the nose shall be corrected."[44]

Similar approaches were described by Dr. M.L. Richardson, who presented a paper in 1926 before the Osteopathic Society of the City of New York, in which he discussed the intranasal use of the finger to alleviate a variety of patient problems: "All of the cranial nerves leave the base of the skull through close-fitting bony foramina. Of the first six, some are constantly, and the others sometimes, in contact with a sinus wall. … That these nerves are accessible to influence from nasal and sinus disease is established clinically and experimentally. … These ganglia with their cranial and sympathetic connections link up the first six with the rest of the cranial nerves and with the cervical sympathetics, establishing a network involving the special senses of sight, hearing, taste and smell; the sensation of the head, face and neck; the motor impulses of expression, voice, deglutition, hearing, and ocular accommodation; and the entire sympathetic system of the head, neck and thorax. In no other part of the body is such a network of nerves and ganglia so exposed to surface influence. … The acute conditions of this district first come to the general practitioner as is proper and best. Your treatment [osteopathic] is superior to any therapy for shortening these inflammatory reactions. … Serious and disabling diseases here develop and progress … we are justified in ordering a complete examination of the district in all cases that do or may suggest an involvement of the cranial nerves or ganglia or sympathetic associations, including facial, cervical and brachial neuritis and neuralgia. Tic douloureux, optic neuritis and atrophy, headaches, especially the low-grade unending type, the sub-occipital type, migraine, vertigo, head noises, deafness, hay fever (seasonal or perennial), bronchial and hay asthma. … digital pressure which will not harm healthy tissue, turbinates and septa, which have been displaced by soft tissue pathology or traumatic injury, are adjusted, adhesions severed, and the patency of the Eustachian tube restored, ventilation and drainage to the paranasal spaces and middle ear recovered and a gradual and permanent improvement to the entire head results. … In proper and qualified hands, finger surgery is safe. It can be depended upon to give results in the conditions mentioned, results that are permanent."[45]

In his 1942 book, *Endo-Nasal, Aural and Allied Technique*, neuropathic physician Dr. Thomas Lake detailed how to introduce a finger into the nasal cavity, along with other techniques for moving the bones of the face and head.[46] Dr. Frank Finnell, a student of Dr. Lake and the teacher of Dr. Stober, mentioned in 1951, "Negative and positive pressure with the finger technique will show marked improvement in every case of nasal catarrh and catarrhal deafness."[47]

For patients with sinusitis, Dr. Lake recommended "nasal dilation" by opening the sutures of the facial bones and inserting a small finger into each nostril one at a time. Dr. Lake emphasized that one of the benefits of this technique is the improvement of breathing, "The fact that they dilate and create a hyperemia in the nasal passages can be ascertained by the much easier breathing of the patient. It is also evidenced by the insertion of a nasal dilator before and after the treatment." Dr. Lake noted in the conclusion

of his book, "The techniques were born of experience and experimentation."[48]

A new technique to adjust the bones of the skull

From a practical point of view, many techniques have been developed over the years to mobilize the bones of the skull, including Dr. Nephi Cottam's Craniopathy,[49] Dr. William Sutherland's cranial osteopathy,[50] Dr. Leo Spears' cranial remolding,[51] Dr. Richardson's finger surgery[52] and Dr. Lake's endonasal techniques.[53]

In 1939, chiropractor Dr. Homer G. Beatty described the intranasal technique again, "nose troubles are usually traumatic" and that "a bent septum may usually be straightened or the turbinates pushed lateralward with a lubricated and covered little finger worked gently into the nostril. Opening the nostrils will free obstructed breathing … Both the internal and external bones and cartilages of the nose may be molded and straightened to a great extent with the fingers."[54]

However, Dr. Beatty also described in the same book, perhaps for the first time in the literature, the practice of insufflating a finger cot into the nose with the aid of a sphygmomanometer bulb, which is particularly indicated for patients presenting with sinusitis: "Inserting a lubricated fingerstall with a wooden applicator and then pumping the fingerstall full of air also massages and separates the mucous walls. A fingerstall may be attached to the sphygmomanometer bulb for this purpose."[54]

It is interesting to note that Dr. Stober mentioned that an older physician told him that the practice of inserting finger cots attached to a blood pressure bulb to open the nasal cavities originated in Germany around 1910.[55]

This insufflation technique was further described in Dr. Joseph Janse and colleagues', *Chiropractic Principles and Technic* (1947), found under the heading "Distention of the Nasal Chamber": "This technic may be used, in conjunction with the sinus manipulations, to open the nasal chambers. Using the detached cuff of an ordinary sphygmomanometer, the doctor attaches to the opening of the inflation tube a carefully lubricated and sterile finger cot. With this probe, he carefully works upward into the nasal chamber, inserting the end of the cut tube a short distance. Then, carefully folding the cuff and grasping it firmly in his hand, the doctor, with the other hand, begins to pump on the cuff bulb. This will slowly distend the finger cot within the nasal chamber in all directions, exerting an even pressure against the walls and turbinates of the nasal chamber and producing a widening and distension of all the sinus openings into the meatuses. Outwardly, that side of the nose treated will bulge, and the patient will experience a marked, but not necessarily distressing, pressure on the inside. The air within the cot is temporarily released, after which another distention is made; this procedure is repeated *several times*."[56]

It is interesting to note that practitioners of manipulative therapy, who had practiced for ten or more years before incorporating BNS into their practice, report witnessing much more remarkable results. The speed and types of results obtained with BNS tend to revolutionize their practice. This was the case of Dr. Adam Del Torto. When he was first exposed to BNS, he left a seminar where it was taught. Fifteen years later, he realized its clinical importance by reading the case of an equestrian who had incurred a concussion following a fall, "had consulted every neurologist and 'brain-trauma expert' on the planet with minimal results" and "got her life back" after a BNS treatment.

Dr. Del Torto learned how to practice BNS, which he introduced into his well-established chiropractic practice, and reported: "So, I took the seminar and quickly realized what had been missing from my practice all these years as I started witnessing a level of healing beyond what I thought was even possible–and usually with last-resort patients who had given up hope of ever getting better–for things like head trauma, post-concussion syndrome, post-stroke symptoms, Bell's palsy, trigeminal neuralgia, migraines, vertigo, tinnitus, seizures, breathing disorders, snoring, sleep apnea, sinusitis, deviated septum, loss of smell, loss of taste, cranial deformities, and the list goes on."[57]

He then realized that up to the time he introduced BNS into his practice, which he calls "cranial ballooning," he was only addressing 20 percent of the nervous system: "The primary focus: the other 80 percent of the nervous system, at the source of the nerve impulse, before we move farther down the chain and concern ourselves with how that nerve impulse is transmitted. Exactly what B.J. [Dr. B.J. Palmer] was talking about when he coined the phrase, 'from above-down' first, before focusing on the second half of the equation, the 'inside-out' portion. Yet as chiropractors, we rarely address the primary subluxation, which lies above the neck in the cranium."[57]

The next step in the history of BNS is Dr. Frank L. Finnell, one of the early chiropractors in Oregon. He received his doctorate in chiropractic from the Pacific Chiropractic College in 1918. Dr. Finnell continued to study in the field that would become his specialty: eye, ear, nose, and throat. He subsequently obtained a doctorate in optometry from the Northern Pacific College of Optometry in 1927. He learned endonasal, oral, and aural techniques directly from Dr. Thomas Lake. In 1944, he became the main instructor of the eye, ear, nose, and throat course at the Western States College of Chiropractic and Naturopathy (WSCCN) and remained on the faculty until 1960. He was, therefore, Dr.

Stober's teacher, who was a student at WSCCN from 1946 until 1951.

In 1951, Dr. Finnell published the first edition of his book, *Manual of Eye, Ear, Nose and Throat: Etiology, Pathology and Treatment of Diseases of the Eye, Ear, Nose and Throat, Including Corrective Measures and Methods of Restoring the Eyesight without the Aid of Glasses*. In it, he introduced the technique described by Drs. Beatty and Janse, under a new name, "If you will refer to this treatment as the nasal specific, it will sound much better than if you speak of the 'balloon treatment.'" This is the first reference in the literature that I could find of the term "Nasal Specific Technic."[47]

Dr. Finnell reported the types of cases in which the endonasal or nasal specific techniques have improved, "Endo-nasal techniques have been used with success in snoring, mouth breathing, coryza, chronic stoppage of the nose, seizures, Grave's disease, diabetes, tachycardia, headaches, insomnia, cervical adenitis, chronic eye trouble, tonsillitis, sinusitis, asthma, otitis media and catarrhal deafness."[47]

Dr. J. Richard Stober (1922-1988) and the Bilateral Nasal Specific

This was when Dr. Richard Stober came into the picture. After serving in the South Pacific during World War II, he matriculated in 1946 at the Western States College of Chiropractic and Naturopathy (WSCCN), from which he graduated with dual degrees in chiropractic in December 1950 and naturopathy in the Spring of 1951. He therefore learned the nasal specific technique from Dr. Finnell.[59]

Dr. Stober later persuaded his younger sister, Appa Anderson (Stober), to enroll at the WSCCN in 1949, three years after he did. She arrived with substantial radiology experience, as during her time in the Women's Auxiliary of the Army Medical Corps from 1944 to 1946, she served as a radiographer. Shortly after graduating from WSCCN in 1953, where she earned dual doctorate degrees in chiropractic and naturopathy, she joined the faculty to teach the radiology course. She eventually became the first female radiologist in the chiropractic profession.

Dr. Richard J. Stober (1922-1988) and his sister, Dr. Appa Anderson (1924-2012).

Dr. Stober mentioned that he first became interested in cranial manipulation while serving in the Navy, where he worked as an assistant to an orthopedist who corrected sailors' broken noses upon their return to base after bar brawls by pulling the nasal septum with an improvised instrument resembling a pair of pliers. While attending school in 1948, Stober stated that he was busy learning osteopathic manipulation from "these old osteopaths."[60]

One year ahead of him at the WSCCN was Wilbur F. King, who was born with cerebral palsy and successfully underwent treatment with Dr. Sutherland's osteopathic cranial manipulation approach.[61] His primary focus as a doctor was to help children born with cerebral palsy. Although he graduated from WSCCN in June 1949, Dr. King remained on campus, possibly to teach cranial manipulation methods he had learned from osteopaths. Dr. Loyd T. Jacob (1928-2022), DC, ND, who graduated from WSCCN in 1954, wrote, "Already in 1952, Stober was teaching cranial manipulation." He was likely continuing Dr. King's teachings after Dr. King had left Portland for Coeur d'Alene, Idaho. However, Dr. Stober continued to learn from Dr. King through frequent visits to his office.

The author's personal communication with Dr. Stober revealed that he lived or practiced near an institution for children with disabilities, where he applied cranial manipulation. One day, after one of those visits to Dr. King in Coeur d'Alene, he drove back home to Oregon–a journey of over six hours–and contemplated using Dr. Finnell's nasal specific technique on those children with disabilities, which he did as soon as he returned to his practice. Eureka! Dr. Stober reported that the results were so remarkable and almost immediate that he radically shifted his practice from cranial osteopathic manipulation to Dr. Finnell's approach with these children.[62] It's estimated that this must have occurred around 1955-1956, as Dr. Stober often said in his 1980 lecture series, "… for the past 25 years …"

Dr. George Siegfried, DC, ND, from McMinnville, Oregon, who practiced alongside Dr. Stober for many years, wrote: "Many patients have had cranial manipulation, craniosacral therapy, torque release technique, condyle lift, and the list of cranial manipulative techniques goes on. However, to my knowledge, the bilateral nasal specific technique, although not by any means the only method of adjusting or manipulating cranial bones, is by far the most impactful. Indeed, due to the lack of research studies, this places it in the clinical research field at best, and anecdotal research at least. … It is a technique that is dynamic, specific and incredibly powerful."[63]

The author would like to add to Dr. Siegfried's testimonial that, in all of his nearly fifty years of experience in the field of manipulative therapy, nothing–old or modern–has been reported to restore health to patients as effectively and efficiently as BNS.

Eventually, Dr. Jacob was one of the first doctors to learn bilateral nasal specific from Dr. Stober: "He [Dr. Stober] was very helpful and said he could 'teach anyone to turn the key in the lock.'" Dr. Jacob commented, "If the wonders done through this treatment were the result of some new medicine or surgery, you'd probably hear about it through the media."[64]

Dr. Stober practiced this technique on nearly all the patients who came to see him. He would see 30 to 50 patients per day, and he chose to have up to 80 percent of his patients be children who were, as a rule, significantly disabled. He reported, with regret, that it took another practitioner more than 10 years to adopt his approach.

Dr. George Siegfried noted that Dr. Stober practiced on Southeast Hawthorne Boulevard in Portland until 1981, when he moved his practice to Milwaukie: "From 1966 until 1985, he also had an office in Seattle, and he had offices in Salem and Canada at other times. He claimed to have cured blind people, deaf-mutes, people afflicted with cerebral palsy and children diagnosed with Down syndrome by using the BNS to expand the cranium."[59]

Dr. Siegfried had been an athlete throughout his life, and when he was younger, he incurred many head injuries. In 1976, after completing his studies at Schiller University in Heidelberg, Germany, he returned to the United States, suffering from the effects of several concussions sustained while playing rugby and boxing. He then consulted Dr. Wendell Diebold,[65] an old osteopath and naturopath who was still teaching at the Western States College of Chiropractic in 1976. He told the injured George Siegfried to instead get treatments from Dr. Stober for his concussions and nasal obstruction due to a broken nose. "Dr. Diebold knew Sutherland and, I believe, worked with him for some time," and said to Siegfried, "As good as Dr. Sutherland's cranial osteopathy is, which he practiced, Dr. Stober took the work to another level. … the efficacy of Dr. Stober's technique surpassed that of Dr. Sutherland. He said what Dr. Sutherland could achieve in 18 months, Dr. Stober would do in less than 10 minutes."

Dr. Siegfried's intimate knowledge of Dr. Stober and his method surpassed that of Dr. Stober's close older colleagues: "Dr. Stober was passionate and fearless in this most unusual specialty. I never saw him turn down an attempt to help someone with problems related to the head and brain. He was blessed with a 6th, 7th and 8th sense!! He knew cranial anatomy and physiology inside and out, upside down, backward and forward. He was kind enough, due to my dogged persistence, to let me sit by his side for years, observing, assisting and discussing cases, many of which were miraculous in their results. Patients with birth-damaged heads, concussions, hearing loss, and speech impairment, chronic sinusitis, migraines, etc., were commonplace."[62]

Dr. Steven Lenahan, a graduate of Western States College of Chiropractic in 1982, shadowed Dr. Stober weekly for a year and reported on his experiences with Dr. Stober in the *Townsend Letter for Doctors*, "The waiting room was always full. And full mostly of mothers holding children. It was obvious from my first step into that waiting room that this abundance of children had special needs. There were many children with Down syndrome and many others who looked like what is termed today developmentally delayed. Working my way to the treatment room, I was shortly introduced as 'the student who called to observe'. Dr. Stober greeted me with that infectious smile and got quickly to work. At first, I thought I was in Dr. Frankenstein's office. The room was mildly disheveled, kind of like a mad scientist with tools of the trade everywhere. It wasn't long before I learned that these were the tools of his trade, unique to him, and most probably found nowhere else on Earth. [Incidentally, the author visited the same office on SE Hawthorne Boulevard in Portland in 1981 and had a similar impression.]

"Soon afterward, I had my first observation of this artist at work. A child was being carried in by her mother. First, it began as a slow whimper, and soon, the inevitable screams and crying. Dr. Stober was rather efficient in his approach. Embracing the child with a gentle reassurance that everything would be all right, he took the child from her mother. Onto the treatment table, customized with seat belts, probably from an old Ford. My eyes must have popped out of my head as I saw that first child strapped down on the table. The 'surgical strike' was at hand. And with the swiftness and compassion only aligned with Dr. Stober, the nasal specific was employed. First, the inferior, then the middle and then the superior nasal meatuses, bilaterally, of course. Then, back to the inferior for the final installment. The whole process took less than 45 seconds. The kid must have felt like she had been struck by a bolt of lightning. Some gentle pumping of the cranium ended this process. With a quick release of the constraints, the young girl was drawn up into his arms and over to the cabinet and given a chewable Vitamin C. With a little joking around, they were best friends again. I soon learned why mothers so willingly gave up their screaming child to this man. Things were happening in his hands that the medical community wasn't able to touch."

Dr. Stober had much to teach, but unfortunately, he didn't take time away from his busy practice to write about his tremendous experience with BNS. This author first encountered BNS while visiting the National College of Naturopathic Medicine in Portland, Oregon, as a prospective student in 1979. I subsequently learned to practice it in 1981 from Dr. Stober. He was one of the most dynamic and enthusiastic teachers ever known. Dr. Stober clearly expressed his desire to write a textbook on BNS at some point. Unfortunately, Dr. Stober died on May 17, 1988, at the age of 66, amid a very active career. Nevertheless, his teachings have endured and continue to reach many, remaining relevant to this day. Hopefully, a recently published practitioner's manual, the first ever on BNS, will help fill part of this void.[66]

Prevention

BNS can play a significant role in preventive medicine. If individuals, especially infants and young children, were routinely examined for head and facial symmetry, posture, and nasal breathing patency during regular check-ups and given appropriate care when needed, it would yield immeasurable benefits. It would be as valuable for health as choosing a lifestyle and environment conducive to it. It would enable individuals to better develop and realize their full potential while significantly reducing the need for healthcare interventions, including costly dental treatments for adolescents. "Full potential" encompasses not only the optimization of physical well-being and emotional and mental growth and expression, but also improved athletic abilities and artistic talents. Additionally, this approach could significantly reduce aberrant behavior that leads to delinquency and crime.[68]

It is the author's hope that a recently published illustrated practitioner's manual on BNS reaches as many healthcare practitioners as possible and that BNS is eventually made available to everyone who could benefit from it. Further, it is this author's hope that a recent book on BNS, aimed at the public, reaches as many people as possible and shows how BNS can help them regain their health.[69]

Conclusion

The primary objective for using BNS is to restore the integrity of the craniofacial structure, which potentially affects the structure and function of the entire body. Many musculoskeletal issues outside the head and face tend to improve after BNS treatments, including restoration of overall posture and structural integrity. Furthermore, by fully restoring nasal breathing, the entire vital process is unleashed, allowing health to naturally return. In addition to alleviating common complaints that drive people to seek BNS treatments, such as the typical effects of concussions (including headaches, dizziness, brain fog, fatigue, pain anywhere in the body, etc.), obstructed nasal breathing, recurrent sinusitis, migraines, or problems with cranial nerve functions, individuals report experiencing longer, deeper, and more restful sleep post-BNS treatments, along with increased energy levels, heightened happiness, reduced anxiety and depression, and significantly improved cognition, alertness, focus, physical strength, endurance and abilities.

The restoration of structural integrity of each individual should thus be at the very heart of any enlightened healthcare system. Further, it is essential to note that the full range of benefits BNS can provide remains to be explored.

Several articles and a book chapter have been written on BNS, all of which are cited in a recently published practitioner's manual.[67] Unfortunately, there has been very little clinical research on BNS. A notable exception is a study demonstrating near or significant improvements in vision, hearing, and craniofacial measurements before and after treatment in a placebo-controlled trial.[70] Most of the evidence for this paper relies on the clinical expertise of multiple generations of BNS practitioners, as compiled in the aforementioned manual, and constitutes one of the three pillars of evidence-based practice.[71]

As this author's specialty is homeopathy, BNS and homeopathy are a natural fit. While homeopathy fine-tunes the vital force, BNS liberates it.

This paper ends with words from Dr. Stober, the undisputed authority on BNS, who encouraged students to learn this technique, "The ones who will today perceive the full potential nasal specific has for unlocking cranial bone jams and helping patients attain greater and more durable health will be on their way to obtaining phenomenal results with them."[72]

Acknowledgements

A large part of this article has been extracted and adapted from the book, *The Art, Principles and Practice of Bilateral Nasal Specific–A Practitioner's Manual,* written by the same author. Another book, *The Life-Changing Treatment That You Need... But Never Heard Of*, written by the author for the public, has also been referenced.

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Book Review:

Saine A. *The Art, Principles and Practice of Bilateral Nasal Specific*. Montreal: Dare to Know, Press of the Canadian Academy of Homeopathy; 2025.

Dr. Saine has written a comprehensive history of a fascinating cranial technique that I've only heard spoken of in whispers, behind closed doors and through four or five patients over my 40 years of practice relating their personal experiences. His voluminous text is replete with historical anecdotes and a rich treasury of personal clinical case histories to illustrate not only the myriad of complaints that are associated with cranial lesions but also their resolution through applying BNS. In his text, Dr. Saine reviews in detail: cranial anatomy, the equipment required, therapeutic treatment planning and the application of the technique. Many of the scenarios shared are frequently seen presentations of the pediatric population ranging from otitis media, chronic sinusitis and sleep-disordered breathing to cerebral palsy, epilepsy, ADHD and ASD.

Dr. Saine's answer to the question, "Why don't our adjustments hold?" Is reiterated time and again in his text, suggesting that thorough cranial adjustments utilizing this technique corrects the foundation around which children are compensating (potentially since birth) and traditional chiropractic adjustments are only ameliorating symptoms for a temporary period of time.

In a healthcare era that includes a growing understanding and appreciation of the benefits of chiropractic and osteopathic treatment, parents are continually seeking more effective, natural approaches to incorporate into their family's health and wellness regime. Dr. Saine makes an excellent case for including this technique in any pediatric chiropractor's repertoire.

Comparative efficacy of conservative interventions for adolescent idiopathic scoliosis: a systematic review and network meta-analysis of randomized controlled trials

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Abstract

Background: Adolescent idiopathic scoliosis (AIS) is a prevalent spinal disorder, and the efficacy of conservative interventions for AIS remains unclear. This study aimed to identify the comparative efficacy of all available conservative interventions for AIS. **Methods:** Nine databases were searched from their inception to February 2024 for randomized controlled trials comparing conservative interventions for AIS. Paired reviewers independently selected studies, assessed risk of bias, and assessed certainty of the evidence. Pairwise meta-analyses were performed by DerSimonian-Laird random-effects model. Network meta-analysis within the frequentist framework was conducted by R package netmeta, and network plots were generated by the network plot command in Stata. **Results:** We identified 3,903 citations, of which 54 trials including 3984 participants were included in our review. All subsequent estimates refer to the comparison with minimal interventions. Brace plus physiotherapeutic scoliosis-specific exercises (PSSE, mean difference (MD): 4.80, 95% confidence interval (CI): 0.56 to 9.04, moderate certainty), manual therapy plus PSSE (MD: 5.26, 95% CI: 1.09 to 9.43, moderate certainty), and manual therapy plus mind-body exercise (MD: 5.14, 95% CI: 1.25 to 9.04, moderate certainty) could be intermediately effective in improving Cobb angle of patients with AIS at post-interventions. Although brace alone (MD: 1.53, 95% CI: 1.09 to 2.14, high certainty) could be the intermediate effective intervention in preventing scoliosis progression, moderate to high certainty evidence showed that brace alone and PSSE alone probably have little or no difference in improving Cobb angle, function, mental health, self-image, angle of trunk rotation (ATR), or satisfaction of patients with AIS compared to minimal interventions. There was no evidence on the follow-up effects of conservative interventions for AIS. We did not identify serious adverse events for any included conservative interventions. **Conclusions:** Brace plus PSSE, manual therapy plus PSSE, and manual therapy plus mind-body exercise could provide short-term effects in improving Cobb angle of patients with AIS. The evidence of brace alone and PSSE alone for managing AIS is still not robust. Our findings are useful for decision-making in clinical practice, as we presented the most comprehensive evidence regarding all available conservative interventions for AIS.

Full text access on line *Pub Med*: Adolescent Idiopathic Scoliosis.
Full text access on line, Springer Link: https://link.springer.com/article/10.1186/s13643-025-02893-1.

Efficacy of non-surgical, non-pharmacological treatments for congenital muscular torticollis: a systematic review and meta-analysis

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Abstract

Background: Congenital Muscular Torticollis (CMT) is the third most common musculoskeletal condition in infancy, and if untreated can lead to significant disability. While a range of conservative treatments are commonly used in the management of CMT, an understanding of their efficacy and safety is limited. This systematic review and meta-analysis, without language or discipline restriction, was conducted to address this knowledge gap. **Methods:** Electronic searches of CENTRAL, PubMed, 22 other electronic databases, three trials registers and Google Scholar, were conducted for randomised controlled trials, which examined any non-surgical, non-pharmacological interventions, including but not limited to manual treatments, movement therapy, acupuncture, adjunctive therapies and physical support, in children aged 0 to 5 years with CMT. Two reviewers independently assessed the risk of bias of the included studies using the Cochrane Risk of bias 1 tool, rated their certainty of evidence using grading of recommendations assessment, development and evaluation (GRADE) framework, and performed random-effects meta-analyses. **Results:** One hundred studies (80 from China) involving 8125 participants published between 1990 and 2023 were included. Adding manual therapy to an active control resulted in short-term improvements in passive cervical rotation (odds ratio (OR) 9.79, 95%CI 4.26,22.50), passive cervical lateroflexion (OR 2.66, 95%CI 1.17,6.04), active cervical rotation (OR 3.94, 95%CI 1.08,14.35), symmetric head posture (OR 4.55, 95%CI 2.57,8.05), sternocleidomastoid tumour thickness (mean difference (MD) -2.12 mm, 95%CI -2.98,-1.26) and development of symmetrical movement (standardised MD -0.70, 95%CI -0.95,-0.45). The addition of an electrophysical agent to an active control reduced sternocleidomastoid tumour thickness (MD -2.03 mm, 95%CI -2.67,-1.39) and optimised Tuina reduced tumour thickness more than traditional Tuina (MD -1.20 mm, 95%CI -1.80,-0.59). Adverse events were uncommon but poorly reported, with 71 (71%) of studies providing no data. Study heterogeneity limited pooling of data for meta-analysis, and there was very low to low certainty evidence for all results, due to high risk of bias, small sample sizes and study heterogeneity. **Conclusions:** This review found that non-surgical, non-pharmacological treatments may be effective for CMT, but the certainty of evidence is very low to

low. These findings are important in informing clinical guidelines and management for CMT and highlight an urgent need for large definitive trials that address the limitations of current studies.

Protocol registration: Cochrane Database of Systematic Reviews (No.: CD012987).
Keywords: Conservative treatment; Electrophysical agents; Infant; Manual therapy; Safety; Traditional Chinese Massage.
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Full text online *BMC*: https://link.springer.com/article/10.1186/s12891-025-08407-3.

Parental management of autoimmune disease with complementary and alternative medicine: a scoping review of the literature in OECD countries
Jordana Maio, Caroline A Smith, Paul R Ward
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doi: 10.1186/s12906-025-04929-4.

Abstract
Introduction: The prevalence of autoimmune disease (AD) is increasing in both paediatric and adult populations, resulting in a rise in healthcare utilisation for symptom management. With no known cure for ADs, management options include conventional medical treatment and/or complementary and alternative medicine (CAM) approaches. Despite the high cost of CAM therapy in Australia, its use continues to rise, especially among adults and children with chronic disease. **Methods:** This review was guided by the JBI methodology for scoping reviews. We reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist. Database searched included OVID (Medline, Embase, PsycInfo) CINAHL, Scopus, Web of Science, ProQuest, and Google Scholar. Only primary empirical papers were included. Screening and data extraction were conducted by two reviewers independently with a third reviewer resolving discrepancies. **Results:** Our review identified 42 primary research papers published between 1990 and 2021 that addressed parental management of AD with CAM. Commonly reported CAM practices included massage, homeopathy, chiropractic care, and acupuncture, with vitamins and minerals being the most frequently mentioned CAM products. Parents cited dissatisfaction with conventional medication, concerns about its side effects, and the perception of CAM as natural or safer than conventional medicine as primary reasons for CAM use. Parental CAM use strongly predicted child CAM use, yet there was low disclosure of CAM practices to conventional physicians. Reasons for non-disclosure included concerns about negative responses from physicians and perceptions of limited physician understanding of CAM. Parental educational level and family income were also predictive of CAM use. **Conclusions:** This review highlights the widespread use of CAM by parents managing their children's AD and emphasises the need for improved communication between parents and healthcare providers. Methodological inconsistencies highlight the necessity for standardised protocols in future CAM research. Additionally, future studies should recognise the interplay between social structures and individual agency in shaping healthcare decisions.

Clinical trial number: Not applicable. PROTOCOL REGISTRATION
Keywords: Autoimmune disease; Children; Complementary and alternative medicine; Health service use.
Full text online *PubMed*: https://pubmed.ncbi.nlm.nih.gov/40634980/.

Does sedentary behaviour cause spinal pain in children and adolescents? A systematic review with meta-analysis
Laura R C Montgomery, Michael Swain, Amabile B Dario, Mary O'Keeffe, Tie P Yamato, Jan Hartvigsen, Simon French, Christopher Williams, Steve Kamper
Br J Sports Med. 2025 Mar 3;59(6):409-422.
doi: 10.1136/bjsports-2024-108648.

Abstract
Objective: To evaluate whether sedentary behaviour is a risk or prognostic factor for spinal pain in children and adolescents. Specifically, to estimate the (1) direction and strength of the association; (2) risk of spinal pain onset and (3) effect on spinal pain prognosis. **Design:** Systematic review with meta-analysis. **Data sources:** Electronic searches of MEDLINE, Embase, CINAHL and Web of Science up to 23 March 2023. **Eligibility criteria for selecting studies**: Reports estimating the effect of sedentary behaviour on spinal pain in young people (≤19 years). **Results:** We included 129 reports, 14 were longitudinal (n = 8 433) and 115 were cross-sectional (n > 697 590). We incorporated 86 studies into meta-analyses. (1) From cross-sectional data, we found low certainty evidence of a small positive association between sedentary behaviour and spinal pain (adjusted odds ratio 1.25 (95% CI 1.17 to 1.33), k = 44, n > 92 617). (2) From longitudinal data, we found low certainty evidence of no increased risk for the onset of spinal pain due to sedentary behaviour (adjusted risk ratio 1.07 (95% CI 0.84 to 1.35), k = 4, n = 1 292). (3) No studies assessed prognosis. **Conclusion**: Cross-sectional data suggest minimally higher odds of spinal pain for children and adolescents who engage in greater sedentary behaviours. However, longitudinal data do not support a causal relationship, indicating that sedentary

behaviour does not increase the risk for onset of spinal pain. Due to the low certainty of evidence, these findings must be interpreted with caution. We found no evidence of the effect sedentary behaviour has on spinal pain prognosis in children and adolescents, highlighting a considerable gap in the literature.

Keywords: Adolescent; Back; Child; Neck; Sedentary Behavior.
Full online access:
PubMed: https://pubmed.ncbi.nlm.nih.gov/39438037/.
BMJ: https://bjsm.bmj.com/content/59/6/409.long.

The characteristics and health service utilization of adolescents with low back pain in a suburban pediatric health care system: analysis of health records data

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Chiropr Man Therap. 2025 Nov 28;33(1):54.
doi: 10.1186/s12998-025-00617-9.

Abstract

Background: Low back pain (LBP) is increasingly common among adolescents, yet little is known about the healthcare utilization in this population. We aimed to describe the characteristics and treatment patterns of adolescents with LBP presenting to a specialized comprehensive pediatric health system. **Methods:** This retrospective single-arm cohort design analyzed de-identified data from a suburban healthcare system. Using the TriNetX analytics platform, we queried electronic health records for adolescents aged 12-18 years with a new diagnosis of LBP between 2018 through 2022 without serious pathology such as cancer or infection. Key variables included baseline patient demographics, comorbidities, initial care setting, and the proportion and count of use of broad categories of healthcare services over a one-year follow-up window. **Results:** Our query identified 6,350 adolescents with LBP (mean age [standard deviation] of 14.8 [1.8] years; 60.6% female). The most common initial setting was ambulatory (80.5%). Services received by patients included non-opioid medication (38.8%), non-pharmacological conservative care (26.1%), diagnostic imaging (29.4%), opioids (11.3%), surgery (0.3%), and interventional injection therapies (≤ 0.2%). **Conclusion:** Among adolescents with newly diagnosed LBP from a specialized comprehensive pediatric healthcare system in Wisconsin from 2018 to 2022, 38.8% were prescribed non-opioid medications, 29.4% obtained diagnostic imaging, 26.1% had non-pharmacological conservative care, and 11.3% were prescribed opioids. Future studies should explore these findings in other care settings and examine optimal care pathways and associated clinical outcomes.

Keywords: Adolescent; Low back pain; Pain management.
Free online access:
PubMed: https://pubmed.ncbi.nlm.nih.gov/41316272/.
BMC: https://link.springer.com/article/10.1186/s12998-025-00617-9.

Exploring Manual Interventions for Infantile Colic: A Scoping Review of the Evidence

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Children (Basel). 2025 Sep 17;12(9):1246.
doi: 10.3390/children12091246.

Abstract

Background: Infantile colic affects up to 40% of otherwise healthy infants and can severely distress caregivers. Manual therapies are increasingly employed as non-pharmacological options, yet their effectiveness and safety remain uncertain. **Methods:** A scoping review was conducted in accordance with Joanna Briggs Institute methodology and reported following PRISMA-ScR. Five databases (MEDLINE, CENTRAL, Scopus, PEDro, Web of Science) were searched from December 2024 to May 2025 without restrictions at the search stage; however, only English-language randomized controlled trials published from 2012 onwards were included at the eligibility stage to ensure consistency and focus on the most recent body of evidence. Randomised controlled trials (RCTs) evaluating hands-on interventions for infants ≤ 6 months with colic were eligible. Two reviewers independently screened records, charted data, and grouped outcomes narratively. **Results:** Seven RCTs investigated abdominal massage, paediatric Tuina, craniosacral therapy, chiropractic manipulation, osteopathic light touch, reflexology, and acupressure. Five trials reported statistically or clinically significant reductions in daily crying (0.6-6.6 h) compared with usual care or sham. Three studies also documented meaningful gains in sleep duration (1.1-2.8 h). Parent-reported satisfaction improved in most interventions. No serious adverse events were recorded, although safety monitoring was inconsistently reported. Substantial heterogeneity in diagnostic criteria, outcome measures, and intervention dose precluded meta-analysis. **Conclusions:** Low-force manual therapies may offer modest short-term relief for colicky infants and improve parental experience, with an apparently favourable safety profile. However, methodological variability and small sample sizes limit certainty. Standardized protocols, objective outcome measures, and robust adverse-event surveillance are priorities for future research.

Keywords: craniosacral therapy; infantile colic; manual therapy; massage.
Full Online access:
PubMed: https://pubmed.ncbi.nlm.nih.gov/41007111/.
MDPI: https://www.mdpi.com/2227-9067/12/9/1246/xml.

Osteopathic treatment of infants with infantile colic/excessive crying: a prospective, multicentric, randomized controlled trial and nested observational trial

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BMC Pediatr. 2025 Jan 30;25(1):77.
doi: 10.1186/s12887-025-05413-1.

Abstract

Background: Colic in infants is defined as excessive crying in an otherwise healthy and thriving baby. Colic is a common but poorly understood and often frustrating problem for caregivers. **Objective:** To study whether osteopathic treatments of infants with infantile colic / excessive crying (IC/EC) have an impact on the subjectively perceived psychological stress of caregivers compared to usual care. **Methods:** The study was designed as a prospective, multicenter, randomized controlled trial. Infants aged 1 week to 3 months and who met Rome IV criteria for IC/EC were included. By means of external randomization, infants were allocated to an intervention group or a control group. Infants in the intervention group received three osteopathic treatments at intervals of one weeks. The treatments were custom-tailored and based on osteopathic principles. Controls received their osteopathic treatment after a 3 week untreated period. The primary outcome parameter was the assessment of parental psychological stress (three questions), measured using a numeric rating scale (NRS; 0-10). Furthermore, the average daily crying time (measured using the Likert scale), the crying intensity (measured using the NRS) and the parents' self-confidence (measured using the Karitane Parenting Confidence Scale) were assessed. **Results:** A total of 103 infants (average age 39.4 ±19.2 days) were included, 52 in the intervention group and 51 in the control group. An inter-group comparison of changes revealed clinically relevant improvements in favor of the intervention group for the main outcome - parameter psychological stress - for all 3 questions (e.g., for question 2 respectively 3, NRS: between group difference of means 3.5; 95% CI: 2.6 to 4.4; $p < 0.001$). For the secondary outcome parameters of crying intensity and crying time/day, the changes were of similar magnitude. **Conclusion:** Three osteopathic treatments given over a period of two weeks led to statistically significant and clinically relevant positive changes of parental psychological stress.

Trial registration: German Clinical Trials Register: DRKS00025867, registration date 10.08.21.
Keywords: Excessive crying; Infantile colic; Infants; OMT; Osteopathic medicine.
Full free online access:
PubMed: https://pubmed.ncbi.nlm.nih.gov/39885436/.
BMC: https://link.springer.com/article/10.1186/s12887-025-05413-1.

Use of osteopathic manipulation techniques for management of acute otitis media in pediatric patients: a scoping review

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Data sources: CINAHL, PubMed, and SCOPUS.
Epub 2025 Jun 6.
doi: 10.1007/s00405-025-09492-9.

Abstract

Objective: To map and summarize the existing literature on the use of osteopathic manipulative techniques (OMT) in the management of acute otitis media (AOM) in pediatric patients, with an emphasis on reported outcomes and identifying gaps in the current evidence. **Review methods:** A comprehensive literature search was conducted across multiple databases following the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guidelines. Studies were charted and summarized based on key characteristics, including study design, population, types of OMT applied, and reported outcomes on management of AOM and recurrent AOM in pediatric patients using OMT. No formal meta-analysis was performed, and all outcome measures were descriptively synthesized. **Results:** Three randomized controlled trial (RCT) studies and one pilot cohort study (N = 205) pertaining to application of OMT in pediatric patients with otitis media were included. Mean age for OMT and control (either sham OMT or standard of care) groups were 19.1 months and 16.8 months; proportions of males were 53.2% and 55.9%, respectively. In the pilot cohort study done by Degenhardt and Kuchera, 62.5% of the subjects experienced no documented recurrence of AOM symptoms at one year post-OMT intervention follow-up; however, since no control group was available for this study, any statistical comparison of recurrence-free rate was unfeasible. In the RCT study by Mills et al., the OMT group showed statistically significant effects on reducing frequency of mean

monthly AOM episodes, resulting in fewer surgical procedures, delaying surgical interventions, increasing resolution of middle ear effusion and better tympanogram readings based on mean sum of types A and C tympanograms, and higher parental satisfaction with overall experience and perceived effectiveness of the OMT on their children on a scale of 0 to 5 when compared to the control group. While statistical interpretation showed some significance in various aspects, OMT's clinical significance remained questionable, especially considering natural course of healing in AOM. In the other RCT study by Steele et al., at the second-week visit during the 3-week OMT intervention period, the OMT group showed a significantly higher likelihood of middle ear effusion resolution based on tympanogram findings and acoustic reflectometer measurements, respectively. However, at one month follow-up visit, there was no statistical significance, alluding to the limited effects of OMT. Finally, in the last RCT study by Whal et al., the OMT group failed to show any significant effects on prevention of recurrence of AOM. **Conclusion:** Current literature on the use of OMT for acute and recurrent otitis media in pediatric patients suggests, with low certainty, that OMT may provide modest benefits in reducing recurrence rates and improving middle ear function. However, the existing evidence is limited in scope and quality. Further research with larger sample sizes and rigorous randomized controlled trial designs is needed to better understand the potential role of OMT in the management of AOM in pediatric patients.

Keywords: Acute otitis media; Children; Ear infection; Osteopathic manipulative treatment (OMT); Pediatric patients; Scoping review; Somatic dysfunction.
Full free online access;
PubMed: https://pubmed.ncbi.nlm.nih.gov/40481343/.
Springer Nature: https://link.springer.com/article/10.1007/s00405-025-09492-9.

Screen Time and Parent-Child Talk When Children Are Aged 12 to 36 Months
Mary E Brushe, Dandara G Haag, Edward C Melhuish, Sheena Reilly, Tess Gregory
JAMA Pediatr. 2024 Apr 1;178(4):369-375.
doi: 10.1001/jamapediatrics.2023.6790.

Abstract
Importance: Growing up in a language-rich home environment is important for children's language development in the early years. The concept of "technoference" (technology-based interference) suggests that screen time may be interfering with opportunities for talk and interactions between parent and child; however, limited longitudinal evidence exists exploring this association. **Objective:** To investigate the longitudinal association between screen time and 3 measures of parent-child talk (adult words, child vocalizations, and conversational turns) when children are 12 to 36 months of age. **Design, setting, and participants:** This Australian prospective cohort study used advanced speech recognition technology to capture young children's screen time and home language environment, on an average 16-hour day. Data were collected from 220 families once every 6 months in the family home when children were 12, 18, 24, 30, and 36 months of age, from January 1, 2018, to December 31, 2021. Statistical analysis took place from November 1, 2022, to July 31, 2023. **Exposure:** Language Environment Analysis (LENA) technology provided automated counts of children's language environment and exposure to electronic noise. The exposure of interest was screen time, which was calculated based on manual coding of LENA electronic noise audio segments. **Main outcomes and measures:** Three measures of parent-child talk were outcomes of focus: adult words, child vocalizations, and conversational turns. Separate models were run for each of the 3 outcomes and included adjustment for child sex, child age, maternal educational level, number of children at home, number of home activities, and primary caregiver's psychological distress. **Results:** The study included 220 families (120 girls [54.6%]; mean [SD] gestational age of children, 39.3 [1.5] weeks; mean [SD] age of mother at childbirth, 31.3 [4.8] years). Adjusted linear mixed-effect models demonstrated that increases in screen time were associated with decreases in measures of parent-child talk. The largest decreases were seen at 36 months, when an additional minute of screen time was associated with a reduction of 6.6 (95% CI, -11.7 to -1.5) adult words, 4.9 (95% CI, -6.1 to -3.7) child vocalizations, and 1.1 (95% CI, -1.4 to -0.8) conversational turns. **Conclusion and relevance:** Findings of this study support the notion of technoference for Australian families, whereby young children's exposure to screen time is interfering with opportunities to talk and interact in their home environment. This finding has implications for interventions and supports aimed at promoting a language-rich home environment, with families needing support in understanding the potential association of screen time with opportunities for children and adults to talk and interact in their home environment.

Full free online access:
PubMed: https://pubmed.ncbi.nlm.nih.gov/38436942/.
JAMA: https://jamanetwork.com/journals/jamapediatrics/fullarticle/2815514.

Pregnancy, Labor, Delivery and Postpartum–2025 Update Evaluation of the evidence on acetaminophen use and neurodevelopmental disorders using the Navigation Guide methodology

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Environ Health. 2025 Aug 14;24(1):56.
doi: 10.1186/s12940-025-01208-0.

Abstract

Background: Acetaminophen is the most commonly used over-the-counter pain and fever medication taken during pregnancy, with > 50% of pregnant women using acetaminophen worldwide. Numerous well-designed studies have indicated that pregnant mothers exposed to acetaminophen have children diagnosed with neurodevelopmental disorders (NDDs), including autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD), at higher rates than children of pregnant mothers who were not exposed to acetaminophen. **Methods:** We applied the Navigation Guide methodology to the scientific literature to comprehensively and objectively examine the association between prenatal acetaminophen exposure and NDDs and related symptomology in offspring. We conducted a systematic PubMed search through February 25, 2025, using predefined inclusion criteria and rated studies based on risk of bias and strength of evidence. Due to substantial heterogeneity, we opted for a qualitative synthesis, consistent with the Navigation Guide's focus on environmental health evidence. **Results:** We identified 46 studies for inclusion in our analysis. Of these, 27 studies reported positive associations (significant links to NDDs), 9 showed null associations (no significant link), and 4 indicated negative associations (protective effects). Higher-quality studies were more likely to show positive associations. Overall, the majority of the studies reported positive associations of prenatal acetaminophen use with ADHD, ASD, or NDDs in offspring, with risk-of-bias and strength-of-evidence ratings informing the overall synthesis. **Conclusions:** Our analyses using the Navigation Guide thus support evidence consistent with an association between acetaminophen exposure during pregnancy and increased incidence of NDDs. Appropriate and immediate steps should be taken to advise pregnant women to limit acetaminophen consumption to protect their offspring's neurodevelopment.

Keywords: ADHD; ASD; Acetaminophen; Neurodevelopmental; Pregnancy.
Full free text online:
PubMed: https://pubmed.ncbi.nlm.nih.gov/40804730/.
BMC: https://link.springer.com/article/10.1186/s12940-025-01208-0.

Combined Complementary and Alternative Therapies for the Management of a Breech Fetus: A Feasibility Study

Shilpa Babbar, Karen B. Williams, Lisa Vawter

AJP Rep 2025; 15(03): e98-e105.
doi: 10.1055/a-2639-7353.

Abstract

Objective: Cesarean rates are rising in the United States, especially for breech presentations, which complicates 3 to 4% of term pregnancies and contributes to maternal morbidity. Complementary and alternative therapies (CT) like moxibustion, chiropractic, and hypnosis have been suggested as noninvasive options to encourage fetal version. This study assessed the feasibility and acceptability of combined CT for breech management. **Study Design:** Women aged >18 with a singleton breech fetus at 34 to 37 weeks engaged in three study visits within 2 weeks. The intervention included therapies such as Spinning Babies techniques, yoga postures, mindset techniques, and chiropractic adjustments. Stress levels were assessed pre- and postintervention. **Results:** Of 24 referrals, 11 completed the study. No fetuses converted to vertex, but participants reported significantly reduced stress ($p = 0.02$). After the intervention, 54.5% opted for an external cephalic version, with a 50% success rate leading to two vaginal deliveries. All participants found the program beneficial, reporting high satisfaction with program duration, structure, and exercises. **Conclusion:** Although fetal version was not achieved, this CT-based program significantly reduced maternal stress, suggesting its value as an emotional management tool in breech pregnancies. Larger trials are needed to evaluate its efficacy in promoting fetal version and improving maternal outcomes. **Key Points:**

- Approximately 86.9% of breech fetuses are delivered by cesarean section.
- Complementary therapies are often employed for a breech fetus with varying success.
- Combined complementary therapies for a breech fetus led a significant reduction in stress.

Keywords: yoga - breech - spinning babies - chiropractic care - pregnancy
Full free online access:
Thieme: https://www.thieme-connect.de/products/ejournals/html/10.1055/a-2639-7353.

Association of oxytocin massage with oxytocin hormone levels and breast milk production in mothers with postpartum blues

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Affiliations Expand

Med J Malaysia. 2025 Nov;80(6):848-852.
PMID: 41328846

Abstract

Introduction: Postpartum blues is a mild adaptation disorder in postpartum mothers that affects psychological and physiological conditions, including breast milk production. This condition significantly impacts maternal health and infant development. This study aimed to examine the association between oxytocin massage, oxytocin hormone levels, and breast milk production in mothers with postpartum blues. **Materials and methods:** A quasi-experimental pre-test and post-test design with treatment and control groups was used. The study was conducted at Siti Fatimah Special District Hospital for Maternal and Child Makassar and Pertiwi Mother and Child Hospital Makassar, from February to November 2024. A total of 68 postpartum mothers with postpartum blues were divided into two groups (34 participants per group). Screening was performed using the EPDS scale, oxytocin levels were measured using the ELISA method, and breast milk production was assessed using a composite scoring system based on three main indicators: (1) infant weight gain, evaluated using the mean value (X) and standard deviation (SD); (2) breastfeeding frequency, recorded through maternal reports and structured observation; and (3) breastfeeding duration, assessed based on the average time per feeding session. Each indicator was assigned a score ranging from 1 to 3, corresponding to low (score 1), moderate (score 2), and high (score 3) levels. The total score from these three components was used to classify overall breast milk production into three categories: high production (total score 7-8), moderate production (total score 5-6), and low production (total score 3-4). Statistical analysis was conducted using SPSS. **Results:** The baseline characteristics were evenly distributed across between the groups. The reduction in EPDS scores was greater in the treatment group (13.44 ± 2.765 to 12.12 ± 3.832) than in the control group (13.97 ± 3.196 to 13.26 ± 2.864), with a significant between-group difference (p = 0.000). Moreover, oxytocin levels increased significantly in the treatment group (47.57 ± 10.42 pg/mL to 52.62 ± 11.33, p = 0.001), whereas no significant change was observed in the control group, except for the comparison of the difference in oxytocin levels between the two groups confirming that this difference is statistically significant (p = 0.007). **Conclusion:** This study suggests that oxytocin massage may serve as a complementary approach therapy for reducing postpartum blues symptoms and enhancing breast milk production. Its integration into clinical practice can support maternal postpartum care by promoting emotional well-being and improving lactation outcomes.

Full free online access:
PubMed: https://pubmed.ncbi.nlm.nih.gov/41328846/.
Article: https://www.e-mjm.org/2025/v80n6/oxytocin-massage.pdf.

Back Acupressure, Baby Positioning and Latching, and Breast Massage Increase Breast Milk Production: A Controlled Clinical Trial

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Acta Med Philipp. 2025 Oct 31;59(16):93—99.
doi: 10.47895/amp.vi0.9130.

Abstract

Background and Objective: Factors that can affect breast milk production include food intake, baby suckling, breast massage, breast anatomy, peace of mind and soul, and rest. Efforts to increase breast milk production can be pharmacological or non-pharmacological therapies. One non-pharmacological method is to use complementary therapy. The aim of this study was to assess the effects of back acupressure, baby attachment position, and breast massage on breast milk production. **Methods:** This study used a controlled clinical trial design. We recruited 100 breastfeeding mothers, and divided them into two groups of 50 each. In the treatment group, back acupressure, baby attachment position, and breast massage were performed. The control group did not receive any intervention, they only followed the usual breastfeeding practices. Data analysis comparing the pre-test and post-test breast milk production utilized the Wilcoxon Test. The significance level was set at $p < 0.05$. **Results:** All respondents completed the four-week study period. Back acupressure, baby attachment position, and breast massage significantly increased breast milk production (p = 0.00, Wilcoxon Test). **Conclusion:** The findings of this study demonstrated that back acupressure, correct baby attachment positioning, and breast massage significantly increased breast milk production in breastfeeding mothers. These non-pharmacological therapies show promise in enhancing lactation. Further research should explore the optimal frequency and duration of these interventions to maximize their effectiveness in promoting breast milk production.

Keywords: acupressure, breast, massage, lactation
Full Free Online Access:
PubMed: https://pmc.ncbi.nlm.nih.gov/articles/PMC12666091/.
PDF: https://actamedicaphilippina.upm.edu.ph/index.php/acta/article/view/9130/6900.

Relaxation Therapy and Human Milk Feeding Outcomes: A Systematic Review and Meta-Analysis

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JAMA Pediatr. 2024 Jun 1;178(6):567-576.
doi: 10.1001/jamapediatrics.2024.0814.

Abstract

Importance: Human milk feeding is a key public health goal to optimize infant and maternal/parental health, but global lactation outcomes do not meet recommended duration and exclusivity. There are connections between lactation and mental health.

Objective: To appraise all available evidence on whether the provision of relaxation interventions to lactating individuals improves lactation and well-being. **Data sources:** Embase, MEDLINE, CINAHL, Allied and Complementary Medicine Database, Web of Science, and the Cochrane Library were searched on September 30, 2023, and topic experts were consulted. **Study selection:** Two independent reviewers screened for eligibility. Inclusion criteria were full-text, peer-reviewed publications with a randomized clinical trial design. Techniques that were entirely physical (eg, massage) were excluded. A total of 7% of initially identified studies met selection criteria. **Data extraction and synthesis:** Two independent reviewers extracted data and assessed risk of bias with the Cochrane Risk of Bias 2 tool. Fixed-effects meta-analysis and Grading of Recommendations, Assessment, Development, and Evaluations guidelines were used to synthesize and present evidence. **Main outcomes and measures:** Prespecified primary outcomes were human milk quantity, length and exclusivity of human milk feeding, milk macronutrients/cortisol, and infant growth and behavior. **Results:** A total of 16 studies were included with 1871 participants (pooled mean [SD] age for 1656 participants, 29.6 [6.1] years). Interventions were music, guided relaxation, mindfulness, and breathing exercises/muscle relaxation. Provision of relaxation was not associated with a change in human milk protein (mean difference [MD], 0 g/100 mL; 95% CI, 0; 205 participants). Provision of relaxation was associated with an increase in human milk quantity (standardized mean difference [SMD], 0.73; 95% CI, 0.57-0.89; 464 participants), increased infant weight gain in breastfeeding infants (MD, z score change = 0.51; 95% CI, 0.30-0.72; 226 participants), and a slight reduction in stress and anxiety (SMD stress score, -0.49; 95% CI, -0.70 to -0.27; 355 participants; SMD anxiety score, -0.45; 95% CI, -0.67 to -0.22; 410 participants). **Conclusions and relevance:** Results of this systematic review and meta-analysis suggest that provision of relaxation was associated with an increase in human milk quantity and infant weight gain and a slight reduction in stress and anxiety. Relaxation interventions can be offered to lactating parents who would like to increase well-being and improve milk supply or, where directly breastfeeding, increase infant weight gain.

Full free online access:
PubMed: https://pubmed.ncbi.nlm.nih.gov/38709505/.
JAMA: https://jamanetwork.com/journals/jamapediatrics/fullarticle/2818395.

Maternal dietary intervention during lactation impacts the maternal faecal and human milk microbiota

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J Appl Microbiol. 2024 May 1;135(5):lxae024.
doi: 10.1093/jambio/lxae024

Abstract

Aims: To determine the effect of a two-week reduced fat and sugar and increased fibre maternal dietary intervention on the maternal faecal and human milk (HM) microbiomes. **Methods and results:** Faecal swabs and HM samples were collected from mothers (n = 11) immediately pre-intervention, immediately post-intervention, and 4 and 8 weeks post-intervention, and were analysed using full-length 16S rRNA gene sequencing. Maternal macronutrient intake was assessed at baseline and during the intervention. Maternal fat and sugar intake during the intervention were significantly lower than pre-intervention (P = <0.001, 0.005, respectively). Significant changes in the bacterial composition of maternal faeces were detected after the dietary intervention, with decreases in the relative abundance of Bacteroides caccae (P = <0.001) and increases in the relative abundance of Faecalibacillus intestinalis (P = 0.006). In HM, the diet resulted in a significant increase in Cutibacterium acnes (P = 0.001) and a decrease in Haemophilus parainfluenzae (P = <0.001). The effect of the diet continued after the intervention, with faecal swabs and HM samples taken 4 and 8 weeks after the diet showing significant differences compared to baseline. **Conclusion:** This pilot study demonstrates that short-term changes in maternal diet during lactation can alter the bacterial composition of the maternal faeces and HM.

Keywords: breastfeeding; human milk microbiome; maternal diet; maternal faecal microbiome.
PubMed: https://pubmed.ncbi.nlm.nih.gov/38323424/
Journal of Applied Microbiology: https://academic.oup.com/jambio/article/135/5/lxae024/7602404?login=false

Interventions for Maintaining Pelvic Floor Health During Pregnancy: A Systematic Review

Yuxuan Wu, Yanbo Zhong, Chao Xu, Hang Li, Mengting Chen, Ling Xu

Physiother Res Int. 2025 Jul;30(3):e70077.
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Abstract

Background and purpose: Pregnancy is a unique life stage for women and is also an independent risk factor for pelvic floor disorders (PFD). Physiological changes during pregnancy can weaken pelvic floor support, potentially leading to common pelvic floor dysfunctions such as urinary incontinence, fecal incontinence, chronic pelvic pain, sexual dysfunction, rectus diastasis, and pelvic organ prolapse if left unaddressed. Early preventive interventions are recommended to reduce the overall incidence of PFD. This review aims to summarize various preventive health care strategies for pelvic floor health during pregnancy. **Methods:** A comprehensive review of the literature was conducted, focusing on studies related to pelvic floor health care during pregnancy. Relevant articles were selected based on their contributions to understanding preventive measures and interventions aimed at maintaining pelvic floor health. **Results:** The research findings outline effective methods for pelvic floor health care during pregnancy, including health education, breathing exercises, pelvic floor muscle training, weight management, perineal massage, and holistic exercise programs. The literature search spanned six electronic databases (PubMed, Cochrane Library, Web of Science, CNKI, Wanfang, and Weipu) with 60 studies meeting inclusion criteria. Given the profound impact of pelvic floor dysfunction on women's quality of life, these strategies can specifically alleviate pelvic floor strain during pregnancy, improve delivery outcomes, promote postpartum recovery, and reduce the risk of PFD, thereby playing a significant role in supporting the overall health of mothers. **Discussion:** Emphasizing early management of pelvic floor health is crucial for the recovery of pelvic floor tissues in pregnant women and should be widely implemented in clinical practice. Healthcare providers should consider each pregnant woman's individual health status, physical abilities, and maternal-fetal safety to develop personalized exercise plans, employing appropriate strategies for early intervention against the pelvic floor during pregnancy which may successfully prevent pelvic floor disorders in women.

Keywords: pelvic floor; pregnancy; preventive health care.

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Pelvic floor muscle exercise practice and its determinants among postpartum women in Central Ethiopia: as a strategy for preventing pelvic floor disorders

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Abstract

Pelvic floor disorders are highly prevalent among reproductive-age women in sub-Saharan Africa and commonly lead to urinary incontinence, pelvic organ prolapse, bowel dysfunction, sexual problems, and reduced quality of life. Pelvic floor muscle exercise, defined as repeated contraction and relaxation of the pelvic floor muscles, is an effective preventive and non-surgical treatment of pelvic floor disorders. However, despite the high burden of pelvic floor disorders in Ethiopia, the significance and role of pelvic floor muscle exercise have not yet been studied in a study setting. This study aimed to assess the Pelvic Floor Muscle Exercise Practice and Its Determinants among Postpartum Women in Gurage Zone, Central Ethiopia. A community-based cross-sectional study was employed from May 12 to June 12, 2023. 422 postpartum women were selected using a systematic random sampling technique. A pre-tested and structured questionnaire was used for data collection. Data were entered into Epidata 3.1 and exported into SPSS version 26 software for analysis. Both bivariable and multivariable binary logistic regressions were performed. Variables with a P-value < 0.05 at a 95% confidence interval were considered statistically significant. In this study,420 study participants were included with a response rate of 99.5%. The proportion of women practicing pelvic floor exercises was 12.14% (95% CI: 6.3, 18.7). Higher education (AOR = 1.40; 95% CI: 1.27, 4.31), ANC visits (AOR = 4.31;95%CI:1.36, 9.57), women with urinary incontinence (AOR = 6.47;95%CI:3.96, 11.54), and women's knowledge (AOR = 6.31;95%CI:3.59, 12.23) were determinants of pelvic floor muscle exercise practice. The present study showed that 87.86% of postpartum mothers lacked proper pelvic floor muscle exercise practices. Thus, encouraging women to attend ANC visits as recommended, providing awareness through health education, and offering counseling on pelvic floor muscle exercises can increase their practice and help reduce pelvic floor disorders.

Keywords: Determinants; Ethiopia; Pelvic floor muscle exercise; Postpartum women.

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PubMed: https://pubmed.ncbi.nlm.nih.gov/41298630/.
Nature: https://www.nature.com/articles/s41598-025-26029-6.

The hidden power in the miracle of pregnancy: the effect of pelvic floor muscle training on fetal and fetal-maternal blood circulation and pelvic floor muscles during pregnancy, a randomized controlled trial

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Abstract

Background: This study aimed to evaluate the effects of individualized pelvic floor muscle training (PFMT) in pregnant women on clitoral artery, umbilical artery (UmA), middle cerebral artery (MCA), uterine artery (UA) blood flow, and pelvic floor muscle (PFM) function. **Methods:** Forty-seven primiparous women between 20 and 38 weeks of gestation were included in the study. Participants were randomly divided into exercise (n = 23) and control (n = 24) groups. The exercise group received an individualized PFMT home program, while the control group received standard antenatal care. Blood flow measurements of the clitoral, UmA, MCA, and UA were performed with Doppler ultrasonography (USG) in both groups. Additionally, PFM function was assessed by digital palpation using the PERFECT system and USG. Measurements were repeated three times at 20-24, 28-32, and 35-38 weeks of gestation. **Results:** A statistically significant increase was observed in PFM endurance and fast twitch values in the PFMT group ($p < 0.001$). No statistically significant difference was found between the groups in the pulsatility indices (PI) of the clitoral, UmA, MCA, and UA at three time points ($p > 0.05$). However, as pregnancy progressed, UmA PI decreased more in the exercise group ($p = 0.004$). The time-dependent change in the MCA/UmA PI ratio was not statistically significant across groups ($p = 0.075$). A Generalized Estimating Equations (GEE) model was used to evaluate the significance of main effects for group, time, and their interaction (group × time). **Conclusion:** PFMT during pregnancy has positive effects on the PFM function and may play a modulating role in the maternal and fetal circulatory systems. Specifically, the positive changes observed in UmA blood flow support the potential benefits of PFMT for fetal well-being. Therefore, we believe recommending PFMT to pregnant women in clinical practice has the potential to enhance their quality of life and support a healthy pregnancy journey. However, more comprehensive, long-term postnatal follow-up studies are needed to definitively confirm PFMT's long-term effects on fetal neurodevelopment.

Trial registration: NCT06861335, 02/28/2025 (retrospectively registered).

Keywords: Blood flow; Fetal doppler ultrasonography; Fetal well-being; MCA; PFMT; Uterine artery.

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Teen Pregnancy and Risk of Premature Mortality

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Abstract

Importance: Unintentional injury, suicide, and homicide are leading causes of death among young females. Teen pregnancy may be a marker of adverse life experiences. **Objective:** To evaluate the risk of premature mortality from 12 years of age onward in association with number of teen pregnancies and age at pregnancy. **Design, setting, and participants:** This population-based cohort study was conducted among all females alive at 12 years of age from April 1, 1991, to March 31, 2021, in Ontario, Canada (the most populous province, which has universal health care and data collection). The study period ended March 31, 2022. **Exposures:** The main exposure was number of teen pregnancies between 12 and 19 years of age (0, 1, or ≥2). Secondary exposures included how the teen pregnancy ended (birth or miscarriage vs induced abortion) and age at first teen pregnancy. **Main outcomes and measures:** The main outcome was all-cause mortality starting at 12 years of age. Hazard ratios (HRs) were adjusted for year of birth, comorbidities at 9 to 11 years of age, and area-level education, income level, and rurality. **Results:** Of 2 242 929 teenagers, 163 124 (7.3%) experienced a pregnancy at a median age of 18 years (IQR, 17-19 years). Of those with a teen pregnancy, 60 037 (36.8%) ended in a birth (of which 59 485 [99.1%] were live births), and 106 135 (65.1%) ended in induced abortion. The median age at the end of follow-up was 25 years (IQR, 18-32 years) for those without a teen pregnancy and 31 years (IQR, 25-36 years) for those with a teen pregnancy. There were 6030 deaths (1.9 per 10 000 person-years [95% CI, 1.9-2.0 per 10 000 person-years]) among those without a teen pregnancy, 701 deaths (4.1 per 10 000 person-years [95% CI, 3.8-4.5 per 10 000 person-years]) among those with 1 teen pregnancy, and 345 deaths (6.1 per 10 000 person-years [95% CI, 5.5-6.8 per 10 000 person-years]) among those with 2 or more teen pregnancies; adjusted HRs (AHRs) were 1.51 (95% CI, 1.39-1.63) for those with 1 pregnancy and 2.14 (95% CI, 1.92-2.39) for those with 2 or more pregnancies. Comparing those with vs without a teen pregnancy, the AHR for premature death was 1.25 (95% CI, 1.12-1.40) from noninjury, 2.06 (95% CI, 1.75-2.43) from unintentional injury, and 2.02 (95% CI, 1.54-2.65) from intentional injury. **Conclusions and relevance:** In this

population-based cohort study of 2.2 million female teenagers, teen pregnancy was associated with future premature mortality. It should be assessed whether supports for female teenagers who experience a pregnancy can enhance the prevention of subsequent premature mortality in young and middle adulthood.

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JAMA: https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2816198.