

## Maternal Report of Outcomes of Chiropractic Care for Infants.

Miller JE, Hanson HA, Hiew M, Lo Tiap Kwong DS, Mok Z, Tee YH.

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### ABSTRACT

**OBJECTIVE:** The purpose of this study was to investigate the report by mothers of their infants' condition before and after a trial of care provided by registered chiropractic clinicians in addition to ratings of satisfaction, cost of care, and reports of any adverse events or side effects. A second purpose was to report the demographic profile of infants who presented for care to 16 chiropractic clinics in the United Kingdom. **METHODS:** This observational study prospectively collected reports by mothers of their infants' demographic profiles and outcomes across several domains of infant behavior and their own mental state using the United Kingdom Infant Questionnaire. Participating registered chiropractors were recruited through the Royal College of Chiropractors annual meeting in January 2016, and 15 clinics and the Anglo-European College of Chiropractic University College teaching clinic volunteered to participate. **RESULTS:** In all, 2001 mothers completed intake questionnaires and 1092 completed follow-up forms. Statistically significant ( $P < .05$ ) improvements were reported across all aspects of infant behavior studied, including feeding problems, sleep issues, excessive crying, problems with supine sleep position, infant pain, restricted cervical range of motion, and time performing prone positioning. Maternal ratings of depression, anxiety, and satisfaction with motherhood also demonstrated statistically significant improvement ( $P < .05$ ). In total, 82% ( $n = 797$ ) reported definite improvement of their infants on a global impression of change scale. As well, 95% ( $n = 475$ ) reported feeling that the care was cost-effective, and 90.9% ( $n = 712$ ) rated their satisfaction 8 or higher on an 11-point scale. Minor self-limiting side effects were reported (5.8%,  $n = 42/727$ ) but no adverse events. **CONCLUSION:** In this study, mothers reported that chiropractic care for their infants was effective, safe, and cost-effective. Although the observational design makes it impossible to determine efficacy, the study's findings indicate that, on average, the changes observed by mothers were positive and may be clinically relevant.

**KEYWORDS:** Chiropractic; Complementary therapies; Infant.

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## Utilization of Chiropractic Care in US Children and Adolescents: A Cross-Sectional Study of the 2012 National Health Interview Survey.

Peng T, Chen B, Gabriel KP

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### ABSTRACT

**OBJECTIVE:** The purpose of this study was to describe the prevalence of chiropractic utilization and examine sociodemographic characteristics associated with utilization in a representative sample of US children and adolescents aged 4 to 17 years. **METHODS:** Data are from 9734 respondents to the 2012 National Health Interview Survey. Age, sex, race/ethnicity, geography, family income, parental educational attainment, and other health care providers served as exposure variables. Chiropractic utilization in the past 12 months (yes/no) was the targeted outcome. Weighted crude and adjusted logistic regression models, controlling for relevant covariates, were performed. **RESULTS:** The 12-month prevalence of chiropractic utilization in US children was 3.0% (95% confidence interval: 2.6%-3.6%). The adjusted odds (95% confidence interval) of chiropractic utilization were higher among 11- to 17-year-olds (2.02 [1.41-2.90]) (vs 4- to 10-year-olds), Midwest residents (2.45 [1.36-4.44]) (vs Northeast), families with incomes  $\geq$ \$100000 (3.25 [1.87-5.66]) (vs  $<$ \$35000), and those that visited other Complementary and Integrative Health (also known as Complementary and Alternative Medicine) practitioners (11.26 [7.19-17.64]). Blacks and Asians had lower adjusted odds of chiropractic utilization compared with whites (0.17 [0.06-0.47] and 0.17 [0.07-0.43], respectively). Sex, parental education, and having an orthodox medical personal physician were not associated with utilization. **CONCLUSION:** Although overall prevalence was low, sociodemographic characteristics of child and adolescent users of chiropractic care were identified. Age, race/ethnicity, region of residence, family income, and utilization of other Complementary and Integrative Health services were associated with chiropractic utilization, after adjusting for sociodemographic covariates.

**KEYWORDS:** Adolescent; Child; Chiropractic; Complementary therapies; Integrative medicine; Pediatrics.

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## Manual therapy for the pediatric population: a systematic review.

Parnell Prevost C, Gleberzon B, Carleo B, Anderson K, Cark M, Pohlman KA  
*BMC Complement Altern Med.*, 2019 Mar 13;19(1):60. doi: [10.1186/s12906-019-2447-2](https://doi.org/10.1186/s12906-019-2447-2).

### ABSTRACT

**Background:** This systematic review evaluates the use of manual therapy for clinical conditions in the pediatric population, assesses the methodological quality of the studies found, and synthesizes findings based on health condition. We also assessed the reporting of adverse events within the included studies and compared our conclusions to those of the UK Update report. **Methods:** Six databases were searched using the following inclusion criteria: children under the age of 18 years old; treatment using manual therapy; any type of healthcare profession; published between 2001 and March 31, 2018; and English. Case reports were excluded from our study. Reference tracking was performed on six published relevant systematic reviews to find any missed article. Each study that met the inclusion criteria was screened by two authors to: (i) determine its suitability for inclusion, (ii) extract data, and (iii) assess quality of study. **Results:** Of the 3563 articles identified, 165 full articles were screened, and 50 studies met the inclusion criteria. Twenty-six articles were included in prior reviews with 24 new studies identified. Eighteen studies were judged to be of high quality. Conditions evaluated were: attention deficit hyperactivity disorder (ADHD), autism, asthma, cerebral palsy, clubfoot, constipation, cranial asymmetry, cuboid syndrome, headache, infantile colic, low back pain, obstructive apnea, otitis media, pediatric dysfunctional voiding, pediatric nocturnal enuresis, postural asymmetry, preterm infants, pulled elbow, suboptimal infant breastfeeding, scoliosis, suboptimal infant breastfeeding, temporomandibular dysfunction, torticollis, and upper cervical dysfunction. Musculoskeletal conditions, including low back pain and headache, were evaluated in seven studies. Twenty studies reported adverse events, which were transient and mild to moderate in severity. **Conclusions:** Fifty studies investigated the clinical effects of manual therapies for a wide variety of pediatric conditions. Moderate-positive overall assessment was found for 3 conditions: low back pain, pulled elbow, and premature infants. Inconclusive unfavorable outcomes were found for 2 conditions: scoliosis (OMT) and torticollis (MT). All other condition's overall assessments were either inconclusive favorable or unclear. Adverse events were uncommonly reported. More robust clinical trials in this area of healthcare are needed.

**KEYWORDS:** Pediatric, Manual therapy, Chiropractic, Osteopathic, Systematic review.

PROSPERA registration number: CRD42018091835.

## The natural course of low back pain from childhood to young adulthood - a systematic review.

Junge T, Wedderkopp N, Boyle E, Kjaer P  
*Chiropr Man Therap.*, 2019 Mar 20;27:10. doi: [10.1186/s12998-018-0231-x](https://doi.org/10.1186/s12998-018-0231-x). eCollection 2019.

### ABSTRACT

**Background:** Taking the natural course of recurrent and fluctuating low back pain (LBP) seen in longitudinal studies of adults into consideration, the aetiology and development of LBP in children and adolescents also needs to be reflected in a long-term course. Therefore, a systematic critical literature review was undertaken to assess the natural course of LBP in the general population from childhood through adolescence to young adulthood. **Methods:** A systematic literature search was conducted in MEDLINE, EMBASE, CINAHL and PsycINFO with synonyms of search terms for 1) low back pain; 2) natural course; 3) cohort study and 4) children. Records in English, German, French, Danish, Swedish, and Norwegian were included. To assess the methodological quality of the studies, the NIH quality assessment checklist for cohort studies was adapted and risk of bias was assessed on a study level. Two authors independently reviewed selected studies, assessed quality, and extracted data. A synthesis of results in relation to the natural course of LBP was created. **Results:** Totally, 3373 records were identified, eight articles were included for quality assessment, and finally, four studies of good to fair quality were included for synthesis of results. Indication of three common patterns of LBP were identified across studies and labelled as 1) 'children and adolescents with no LBP or low probability of LBP' (49 to 53%), 2) 'children and adolescents with fluctuation of LBP' (16 to 37%) and 3) 'children and adolescents with repeated reporting of LBP' (<1 to 10%). **Conclusion:** Although methodological heterogeneity, mainly due to different age ranges, an indication of a natural course of LBP was seen across studies. The majority of children and adolescents repeatedly reporting no or low probability of LBP. With recall periods between one week to three months and sampling rates ranging from one to four years, a very low rate repeatedly reported LBP, and approximately one-fifth to one-third of children and adolescents had fluctuating reports of LBP. A need of future research of LBP trajectories with short reporting period lengths and narrower sampling windows in a long-term perspective is emphasized in order to study childhood influences on the development of LBP throughout life.

**KEYWORDS:** Children and adolescence; Low back pain; Natural course.

## The Feeding Infants and Toddlers Study (FITS) 2016: Moving Forward.

Johanna T Dwyer

*J Nutr.* 2018 Sep; 148(Suppl 3): 1575S—1580S.

Published online 2018 Aug 31. doi: [10.1093/jn/nxy159](https://doi.org/10.1093/jn/nxy159)

### ABSTRACT

**INTRODUCTION:** The years from birth through preschool involve more changes in growth, development, eating patterns, nutrition, and other functions than any other time of life. Food consumption during this time is dynamic and is influenced by rapidly changing trends in feeding practices for infants and young children, as well as by longer-term trends in family incomes and food programs. It is critical to know what children are being fed, what they are eating, and how practices are changing, if we are to craft interventions that lay a solid nutritional foundation for later health, decrease risks of inappropriate eating habits, and develop evidence-based feeding recommendations. Informal guidelines for feeding the young have been available since antiquity. Today, we use formal evaluation of the evidence before making recommendations. Of particular relevance here is the Birth to 24 Months (B-24) project to evaluate data and support the addition of the first ever recommendations for children younger than 24 mo to the 2020—2025 Dietary Guidelines for Americans. Sound recommendations must be based on up-to-date information, and yet data on intakes and eating patterns are sparse, particularly for those <24 mo of age. NHANES provides much useful information for children <24 mo of age, but the sample sizes of both breast- and bottle-fed infants and toddlers are insufficient to trace the rapid changes in intakes that occur during that time. The *Feeding Infants and Toddlers Study (FITS) 2016* contributes to this evidence base and complements NHANES by applying similar methods to a large sample of infants and toddlers aged <24 mo, including minorities, providing greater detail about the adequacy of usual nutrient intakes and the foods and food groups consumed. FITS 2016 is a cross-sectional study of caregivers of children under the age of 4 y living in the 50 states and Washington DC. Data collection occurred between June 2015 and May 2016. A recruitment interview (respondent and child characteristics, feeding practices including responsive feeding and reasons for starting or stopping breastfeeding, physical activity, screen use, sleep habits, participation in food assistance programs) was completed by telephone or online. This was followed by a feeding practices questionnaire and a 24-h recall conducted by telephone. A second 24-h recall was collected for a random subsample of 25% of the total sampled population. Because FITS is a telephone survey, direct anthropometric data could not be collected; the lack of accurate anthropometric data or other biomarkers to link the food consumption data collected to health outcomes is a limitation.

## Association of Maternal Neurodevelopmental Risk Alleles With Early-Life Exposures.

Beate Leppert, Ph.D.; Alexandra Havdahl, Ph.D., Lucy Riglin, Ph.D., et al

*JAMA Psychiatry*, Published online May 01, 2019. doi:[10.1001/jamapsychiatry.2019.0774](https://doi.org/10.1001/jamapsychiatry.2019.0774)

### ABSTRACT

**Importance:** Early-life exposures, such as prenatal maternal lifestyle, illnesses, nutritional deficiencies, toxin levels, and adverse birth events, have long been considered potential risk factors for neurodevelopmental disorders in offspring. However, maternal genetic factors could be confounding the association between early-life exposures and neurodevelopmental outcomes in offspring, which makes inferring a causal relationship problematic. **Objective:** To test whether maternal polygenic risk scores (PRSs) for neurodevelopmental disorders were associated with early-life exposures previously linked to the disorders. **Design, Setting, and Participants:** In this UK population-based cohort study, 7921 mothers with genotype data from the Avon Longitudinal Study of Parents and Children (ALSPAC) underwent testing for association of maternal PRS for attention-deficit/hyperactivity disorder (ADHD PRS), autism spectrum disorder (ASD PRS), and schizophrenia (SCZ PRS) with 32 early-life exposures. ALSPAC data collection began September 6, 1990, and is ongoing. Data were analyzed for the current study from April 1 to September 1, 2018. **Exposures:** Maternal ADHD PRS, ASD PRS, and SCZ PRS were calculated using discovery effect size estimates from the largest available genome-wide association study and a significance threshold of  $P < .05$ . **Main Outcomes and Measures:** Outcomes measured included questionnaire data on maternal lifestyle and behavior (eg, smoking, alcohol consumption, body mass index, and maternal age), maternal use of nutritional supplements and medications in pregnancy (eg, acetaminophen, iron, zinc, folic acid, and vitamins), maternal illnesses (eg, diabetes, hypertension, rheumatism, psoriasis, and depression), and perinatal factors (eg, birth weight, preterm birth, and cesarean delivery). **Results:** Maternal PRSs were available from 7921 mothers (mean [SD] age, 28.5 [4.8] years). The ADHD PRS was associated with multiple prenatal factors, including infections (odds ratio [OR], 1.11; 95% CI, 1.04-1.18), use of acetaminophen during late pregnancy (OR, 1.11; 95% CI, 1.04-1.18), lower blood levels of mercury ( $\beta$  coefficient, -0.06; 95% CI, -0.11 to -0.02), and higher blood levels of cadmium ( $\beta$  coefficient, 0.07; 95% CI, 0.05-0.09). Little evidence of associations between ASD PRS or SCZ PRS and prenatal factors or of association between any of the PRSs and adverse birth events was found. Sensitivity analyses revealed consistent results. **Conclusions and Relevance:** These findings suggest that maternal risk alleles for neurodevelopmental disorders, primarily ADHD, are associated with some pregnancy-related exposures. These findings highlight the need to carefully account for potential genetic confounding and triangulate evidence from different approaches when assessing the effects of prenatal exposures on neurodevelopmental disorders in offspring.

## A scoping review of chiropractic management of female patients with infertility.

Budgell B, Yee B

*J Can Chiropr Assoc.*, 2018 Aug;62(2):117-124.

Abstract in [English](#), [French](#)

### ABSTRACT

**Background:** Debate concerning chiropractic management of female infertility occurs largely in the absence of reference to the extant literature. **Methods:** A scoping review was conducted of primary (original) data publications on the chiropractic management of female infertility based on searches of the Index to Chiropractic Literature and Pubmed, supplemented by papers from one author's archive. **Results:** Ten articles, all case studies, met the review's inclusion criteria and documented the experiences of 11 women (mean age 31 years; mean period of infertility 3 years). Pregnancy occurred, on average, after five months of treatment with spinal manipulation and adjunctive modalities. No adverse events were reported. **Discussion:** There are very few original data articles documenting responses of infertile females treated with spinal manipulation. **Conclusions:** In the absence of a robust body of primary data literature, the use of spinal manipulation the management of female infertility should be approached with caution.

**KEYWORDS:** Chiropractic; Infertility; Scoping review.

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## The Awareness of the Fascial System.

Bordoni B, Simonelli M

*Cureus*, 2018 Oct 1;10(10):e3397. doi: [10.7759/cureus.3397](https://doi.org/10.7759/cureus.3397).

### ABSTRACT

Fascia is a cacophony of functions and information, a completely adaptable entropy complex. The fascial system has a solid and a liquid component, acting in a perfect symbiotic synchrony. Each cell communicates with the other cells by sending and receiving signals; this concept is a part of quantum physics and it is known as quantum entanglement: a physical system cannot be described individually, but only as a juxtaposition of multiple systems, where the measurement of a quantity determines the value for other systems. Fascial continuum serves as a target for different manual approaches, such as physiotherapy, osteopathy and chiropractic. Cellular behaviour and the inclusion of quantum physics background are hardly being considered to find out what happens between the operator and the patient during a manual physical contact. The article examines these topics. According to the authors' knowledge, this is the first scientific text to offer manual operators' new perspectives to understand what happens during palpatory contact. A fascial cell has not only memory but also the awareness of the mechanometabolic information it feels, and it has the anticipatory predisposition in preparing itself for alteration of its natural environment.

**KEYWORDS:** Fascia; Fascial system; Myofascial; Physiology; Quantum physics.

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## The Role of Vitamin D in the Pathogenesis of Adolescent Idiopathic Scoliosis.

Ng SY, Bettany-Saltikov J, Cheung IYK1, Chan KKY

*Asian Spine J*, 2018 Dec;12(6):1127-1145. doi: [10.31616/asj.2018.12.6.1127](https://doi.org/10.31616/asj.2018.12.6.1127). Epub 2018 Oct 16.

### ABSTRACT

Several theories have been proposed to explain the etiology of adolescent idiopathic scoliosis (AIS) until present. However, limited data are available regarding the impact of vitamin D insufficiency or deficiency on scoliosis. Previous studies have shown that vitamin D deficiency and insufficiency are prevalent in adolescents, including AIS patients. A series of studies conducted in Hong Kong have shown that as many as 30% of these patients have osteopenia. The 25-hydroxyvitamin D<sub>3</sub> level has been found to positively correlate with bone mineral density (BMD) in healthy adolescents and negatively with Cobb angle in AIS patients; therefore, vitamin D deficiency is believed to play a role in AIS pathogenesis. This study attempts to review the relevant literature on AIS etiology to examine the association of vitamin D and various current theories. Our review suggested that vitamin D deficiency is associated with several current etiological theories of AIS. We postulate that vitamin D deficiency and/or insufficiency affects AIS development by its effect on the regulation of fibrosis, postural control, and BMD. Subclinical deficiency of vitamin K<sub>2</sub>, a fat-soluble vitamin, is also prevalent in adolescents; therefore, it is possible that the high prevalence of vitamin D deficiency is related to decreased fat intake. Further studies are required to elucidate the possible role of vitamin D in the pathogenesis and clinical management of AIS.

**KEYWORDS:** Bone density; Scoliosis; Vitamin D; Vitamin K.

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## Massage, reflexology and other manual methods for pain management in labour.

Smith CA, Levett KM, Collins CT, Dahlen HG, Ee CC, Sukanuma M.

Cochrane Database Syst Rev. 2018 Mar 28;3:CD009290. doi: [10.1002/14651858.CD009290.pub3](https://doi.org/10.1002/14651858.CD009290.pub3).

### ABSTRACT

**Background:** Many women would like to avoid pharmacological or invasive methods of pain management in labour, and this may contribute towards the popularity of complementary methods of pain management. This review examined the evidence currently available on manual methods, including massage and reflexology, for pain management in labour. This review is an update of the review first published in 2012. **OBJECTIVES:** To assess the effect, safety and acceptability of massage, reflexology and other manual methods to manage pain in labour. **SEARCH METHODS:** For this update, we searched Cochrane Pregnancy and Childbirth's Trials Register (30 June 2017), the Cochrane Central Register of Controlled Trials (CENTRAL; 2017, Issue 6), MEDLINE (1966 to 30 June 2017, CINAHL (1980 to 30 June 2017), the Australian New Zealand Clinical Trials Registry (4 August 2017), Chinese Clinical Trial Registry (4 August 2017), ClinicalTrials.gov, (4 August 2017), the National Center for Complementary and Integrative Health (4 August 2017), the WHO International Clinical Trials Registry Platform (ICTRP) (4 August 2017) and reference lists of retrieved trials. **SELECTION CRITERIA:** We included randomised controlled trials comparing manual methods with standard care, other non-pharmacological forms of pain management in labour, no treatment or placebo. We searched for trials of the following modalities: massage, warm packs, thermal manual methods, reflexology, chiropractic, osteopathy, musculo-skeletal manipulation, deep tissue massage, neuro-muscular therapy, shiatsu, tuina, trigger point therapy, myotherapy and zero balancing. We excluded trials for pain management relating to hypnosis, aromatherapy, acupuncture and acupressure; these are included in other Cochrane reviews. **DATA COLLECTION AND ANALYSIS:** Two review authors independently assessed trial quality, extracted data and checked data for accuracy. We contacted trial authors for additional information. We assessed the quality of the evidence using the GRADE approach. **MAIN RESULTS:** We included a total of 14 trials; 10 of these (1055 women) contributed data to meta-analysis. Four trials, involving 274 women, met our inclusion criteria but did not contribute data to the review. Over half the trials had a low risk of bias for random sequence generation and attrition bias. The majority of trials had a high risk of performance bias and detection bias, and an unclear risk of reporting bias. We found no trials examining the effectiveness of reflexology. **Massage** We found low-quality evidence that massage provided a greater reduction in pain intensity (measured using self-reported pain scales) than usual care during the first stage of labour (standardised mean difference (SMD) -0.81, 95% confidence interval (CI) -1.06 to -0.56, six trials, 362 women). Two trials reported on pain intensity during the second and third stages of labour, and there was evidence of a reduction in pain scores in favour of massage (SMD -0.98, 95% CI -2.23 to 0.26, 124 women; and SMD -1.03, 95% CI -2.17 to 0.11, 122 women). There was very low-quality evidence showing no clear benefit of massage over usual care for the length of labour (in minutes) (mean difference (MD) 20.64, 95% CI -58.24 to 99.52, six trials, 514 women), and pharmacological pain relief (average risk ratio (RR) 0.81, 95% CI 0.37 to 1.74, four trials, 105 women). There was very low-quality evidence showing no clear benefit of massage for assisted vaginal birth (average RR 0.71, 95% CI 0.44 to 1.13, four trials, 368 women) and caesarean section (RR 0.75, 95% CI 0.51 to 1.09, six trials, 514 women). One trial reported less anxiety during the first stage of labour for women receiving massage (MD -16.27, 95% CI -27.03 to -5.51, 60 women). One trial found an increased sense of control from massage (MD 14.05, 95% CI 3.77 to 24.33, 124 women, low-quality evidence). Two trials examining satisfaction with the childbirth experience reported data on different scales; both found more satisfaction with massage, although the evidence was low quality in one study and very low in the other. **Warm packs** We found very low-quality evidence for reduced pain (Visual Analogue Scale/VAS) in the first stage of labour (SMD -0.59, 95% CI -1.18 to -0.00, three trials, 191 women), and the second stage of labour (SMD -1.49, 95% CI -2.85 to -0.13, two trials, 128 women). Very low-quality evidence showed reduced length of labour (minutes) in the warm-pack group (MD -66.15, 95% CI -91.83 to -40.47; two trials; 128 women). **Thermal manual methods** One trial evaluated thermal manual methods versus usual care and found very low-quality evidence of reduced pain intensity during the first phase of labour for women receiving thermal methods (MD -1.44, 95% CI -2.24 to -0.65, one trial, 96 women). There was a reduction in the length of labour (minutes) (MD -78.24, 95% CI -118.75 to -37.73, one trial, 96 women, very low-quality evidence). There was no clear difference for assisted vaginal birth (very low-quality evidence). Results were similar for cold packs versus usual care, and intermittent hot and cold packs versus usual care, for pain intensity, length of labour and assisted vaginal birth. **Music** One trial that compared manual methods with music found very low-quality evidence of reduced pain intensity during labour in the massage group (RR 0.40, 95% CI 0.18 to 0.89, 101 women). There was no evidence of benefit for reduced use of pharmacological pain relief (RR 0.41, 95% CI 0.16 to 1.08, very low-quality evidence). Of the seven outcomes we assessed using GRADE, only pain intensity was reported in all comparisons. Satisfaction with the childbirth experience, sense of control, and caesarean section were rarely reported in any of the comparisons. **AUTHORS' CONCLUSIONS:** Massage, warm pack and thermal manual methods may have a role in reducing pain, reducing length of labour and improving women's sense of control and emotional experience of labour, although the quality of evidence varies from low to very low and few trials reported on the key GRADE outcomes. Few trials reported on safety as an outcome. There is a need for further research to address these outcomes and to examine the effectiveness and efficacy of these manual methods for pain management.

## Physical risk factors for adolescent neck and mid back pain: a systematic review.

Wirth B, Potthoff T, Rosser S, Humphreys BK, de Bruin ED

*Chiropr Man Therap.*, 2018 Sep 24;26:36. doi: [10.1186/s12998-018-0206-y](https://doi.org/10.1186/s12998-018-0206-y). eCollection 2018.

### ABSTRACT

**Background:** Besides low back pain (LBP), also neck pain (NP) and mid back pain (MBP) are common health issues in adolescence. Psychological factors are regarded as main risk factors for spinal pain in adolescence, but recent studies suggest that the importance of physical factors might be underestimated. The purpose of this study was to summarize the results of studies on physical risk factors for adolescent NP and MBP. **Methods:** Cross-sectional and prospective English studies on NP and MBP in adolescents aged 10 to 18 were searched by a professional librarian in Medline (OvidSP), Premedline (PubMed), EMBASE, Cochrane, CINAHL, PEDro and PsycINFO up to October 2016. Studies that were restricted to self-report via questionnaires were excluded. **Results:** Eight cross-sectional studies could be included in this review. Some aspects of sagittal alignment in sitting (increased lumbar lordosis) and standing (anteroposition of the head, sway-back posture) were associated with NP. Study comparability was impeded by inconsistent definitions of NP and MBP and a wide variety of outcome measures. **Conclusions:** This systematic review indicates that prospective studies using a consistent definition of NP and MBP are needed. Such studies might further investigate sagittal alignment in sitting and standing as possible risk factors for NP and MBP in adolescence using a consistent terminology for the outcomes and longitudinal research designs.

**KEYWORDS:** Adolescent; Mid back pain; Neck pain; Systematic review.

## Demographic Profile of Chiropractors Who Treat Children: A Multinational Survey.

Matthew F.Doyle MSc., Joyce E.Miller DC, PhD

*Journal of Manipulative & Physiological Therapeutics*, Volume 42, Issue 1, January 2019. <https://doi.org/10.1016/j.jmpt.2018.03.007>

### ABSTRACT

**Objective:** The purpose of this study was to survey the demographic profile and educational background of chiropractors with pediatric patients on a multinational scale. **Methods:** A multinational online cross-sectional demographic survey conducted over a 15-day period in July 2010. The survey was electronically administered via chiropractic associations in 17 countries, using SurveyMonkey for data acquisition, transfer, and descriptive analysis. **Results:** The response rate was 10.1%, and 1498 responses were received from 17 countries on 6 continents. Of these, 90.4% accepted pediatric cases. The average practitioner was male (61.1%) and 41.4 years old, had 13.6 years in practice, and saw 107 patient visits per week. Regarding educational background, 63.4% had a bachelor's degree or higher in addition to their chiropractic qualification, and 18.4% had a postgraduate certificate or higher in pediatric chiropractic. **Conclusion:** This is the first study about chiropractors who treat children from the United Arab Emirates, Peru, Japan, South Africa, and Spain. Although the response rate was low, the results of this multinational survey suggest that pediatric chiropractic care may be a common component of usual chiropractic practice on a multinational level for these respondents.

**KEYWORDS:** Chiropractic, Child, Pediatrics, Demography.

## Injuries of the adolescent girl athlete: a review of imaging findings.

Kimberly Shampain, Kara Gaetke-Udager, Jessica R. Leschied, Nathaniel B. Meyer, Matthew R. Hammer, Keri L. Denay, Corrie M. Yablon  
*Skeletal Radiology*, (2019) 48: 77. <https://doi.org/10.1007/s00256-018-3029-y>

### ABSTRACT

With the rising participation of girls in sports at both the recreational and elite levels, there has also been increased awareness of injuries common in this athlete population. Anatomic differences between boys and girls cause girl athletes to be predisposed to certain injuries. Certain behavioral patterns, such as eating disorders, also cause problems specific to girl athletes that may result in injury. Imaging plays a large role in diagnosis and ongoing management, but there has been only scant literature dedicated to the specific topic of imaging in girl athletes. The purpose of this article is to review the imaging findings and recommendations for injuries and other conditions affecting the adolescent girl athlete. This article first provides an overview of the key anatomic differences between boys and girls, including both static and dynamic factors, as well as non-anatomic differences, such as hormonal factors, and discusses how these differences contribute to the injury patterns that are seen more typically in girls. The article then reviews the imaging findings in injuries that are commonly seen in girl athletes. There is also a discussion of the "female athlete triad," which consists of osteoporosis, disordered eating, and amenorrhea, and the role of imaging in this condition.

**KEYWORDS:** Female athlete; Female athlete triad; MRI; Pediatrics; Sports medicine.

## Dietary Intake, Nutrient Status, and Growth Parameters in Children with Autism Spectrum Disorder and Severe Food Selectivity: An Electronic Medical Record Review.

Sharp WG, Postorino V, McCracken CE, Berry RC, Criado KK, Burrell TL, Scahill L.  
*J Acad Nutr Diet.*, 2018 Oct;118(10):1943-1950. doi: [10.1016/j.jand.2018.05.005](https://doi.org/10.1016/j.jand.2018.05.005). Epub 2018 Jul 10.

### ABSTRACT

**BACKGROUND:** Food selectivity is common in children with autism spectrum disorder (ASD). The clinical characteristics, however, of severe food selectivity in children with ASD is not well documented. **OBJECTIVE:** This study examined the demographic characteristics, anthropometric parameters, risk of nutritional inadequacy, dietary variety, and problematic mealtime behaviors in a sample of children with ASD with severe food selectivity. **DESIGN:** The study involved a cross-sectional electronic medical record review. Data extraction followed a systematic protocol for data extraction. **PARTICIPANTS/SETTING:** Children (age 2 to 17 years) with ASD, severe food selectivity, and complete nutritional data who received a multidisciplinary evaluation at a specialty feeding clinic in the southeastern United States between January 2014 and January 2016. Criteria for severe food selectivity used in this clinical practice required complete omission of one or more food groups (eg, fruit, vegetable, protein, grain, dairy) or consuming a narrow range of items on a weekly basis (eg, five or fewer total food items). **MAIN OUTCOME MEASURES:** Analyses examined demographic characteristics, dietary preferences, risk for nutritional inadequacies, anthropometric parameters, and problematic mealtime behaviors. **RESULTS:** Of the 279 patients evaluated during the 24-month period, 70 children with ASD and severe food selectivity met inclusion criteria. Caregivers reported 67% of the sample (n=47) omitted vegetables and 27% omitted fruits (n=19). Seventy-eight percent consumed a diet at risk for five or more inadequacies. Risk for specific inadequacies included vitamin D (97% of the sample), fiber (91%) vitamin E (83%), and calcium (71%). Children with five or more nutritional inadequacies (n=55) were more likely to make negative statements during meals ( $P < 0.05$ ). Severe food selectivity was not associated with compromised growth or obesity. **CONCLUSION:** Children with ASD and severe food selectivity may be at increased risk for nutritional inadequacies. Future research should examine causes, consequences, and remediation of severe food selectivity in this population.

**KEYWORDS:** Autism spectrum disorder; Avoidant or restrictive intake disorder; Food selectivity; Nutrition; Pediatric feeding disorders.

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## Effects of pregnancy on lumbar motion patterns and muscle responses.

Biviá-Roig G, Lisón JF, Sánchez-Zuriaga D.  
*Spine J.*, 2019 Feb;19(2):364-371. doi: [10.1016/j.spinee.2018.08.009](https://doi.org/10.1016/j.spinee.2018.08.009). Epub 2018 Aug 22.

### ABSTRACT

**BACKGROUND CONTEXT:** The kinematics of the lumbar region and the activation patterns of the erector spinae muscle have been associated with the genesis of low back pain, which is one of the most common complications associated with pregnancy. Despite the high prevalence of pregnancy-related low back pain, the biomechanical adaptations of the lumbar region during pregnancy remain unknown. **PURPOSE:** This study analyzes lumbar spine motion and the activation pattern of the lumbar erector spinae muscle in healthy pregnant women. **STUDY DESIGN:** A case-control study. **PATIENT SAMPLE:** The study involved 34 nulliparous women (control group) and 34 pregnant women in the third trimester (week 36 ± 1). **OUTCOME MEASURES:** We recorded the parameters of angular displacement of the lumbar spine in the sagittal plane during trunk flexion-extension, and the EMG activity of the erector spinae muscles during flexion, extension, eccentric and concentric contractions, and the myoelectrical silence. **METHODS:** The participants performed several series of trunk flexion-extension movements, which were repeated 2 months postpartum. The position of the lumbar spine was recorded using an electromagnetic motion capture system. EMG activity was recorded by a surface EMG system and expressed as a percentage of a submaximal reference contraction. **RESULTS:** Antepartum measurements showed a decrease (relative to control and postpartum measurements) in lumbar maximum flexion ( $52.5 \pm 10.5^\circ$  vs  $57.3 \pm 7.7^\circ$  and  $58.7 \pm 8.6^\circ$ ;  $p < .01$ ), the percentage of lumbar flexion during forward bending ( $56.4 \pm 5.6\%$  vs  $59.4 \pm 6.8\%$  and  $59.7 \pm 5.6\%$ ;  $p < .01$ ), and the time keeping maximum levels of lumbar flexion ( $35.7 \pm 6.7\%$  vs  $43.8 \pm 5.3\%$  and  $50.1 \pm 3.7\%$ ;  $p < .01$ ). Higher levels of erector spinae activation were observed in pregnant women during forward bending ( $10.1 \pm 4.8\%$  vs  $6.3 \pm 2.4\%$  and  $6.6 \pm 2.7\%$ ;  $p < .01$ ) and eccentric contraction ( $12.1 \pm 5.2\%$  vs  $9.4 \pm 3.1\%$  and  $9.1 \pm 2.9\%$ ;  $p < .01$ ), as well as a shortened erector spinae myoelectric silence during flexion. **CONCLUSIONS:** Pregnant women show adaptations in their patterns of lumbar motion and erector spinae activity during trunk flexion-extension. These changes could be associated with the genesis of pregnancy-related low back pain, by means of biomechanical protection mechanisms against the increase on abdominal mass and ligamentous laxity.

**KEYWORDS:** Electromyography; Erector spinae; Flexion relaxation phenomenon; Low back pain; Lumbar region; Pregnancy.

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## Effect of Exercise Duration on Subsequent Appetite and Energy Intake in Obese Adolescent Girls.

Masurier J, Mathieu ME, Fearnbach SN, Cardenoux C, Julian V, Lambert C, Pereira B, Duclos M, Boirie Y, Thivel D  
*Int J Sport Nutr Exerc Metab.*, 2018 Nov 1;28(6):593-601. doi: [10.1123/ijsnem.2017-0352](https://doi.org/10.1123/ijsnem.2017-0352). Epub 2018 Aug 1.

### ABSTRACT

There is a growing interest regarding the effect of exercise on appetite and energy intake in youth. While the role of exercise intensity has been a primary focus of study, the effect of exercise duration on subsequent food intake has not been fully examined in obese adolescents. On three separate mornings in a randomly assigned order, obese adolescent girls ( $n = 20$ ) aged 12-15 years old were asked to perform a rest session (control, CON) or two cycling sessions for 20 (EX20) or 40 min (EX40) set at their ventilatory threshold. Absolute and relative energy intake were measured from an ad libitum lunch meal 30 min after rest or exercise and appetite feelings assessed using visual analogue scales throughout the day. Hunger, satiety, and prospective food consumption were not significantly different between conditions. Absolute energy intake (kcal) did not differ between conditions, while relative energy intake on EX40 ( $571 \pm 381$  kcal) was significantly lower than during CON ( $702 \pm 320$  kcal;  $p < .05$ ) and EX20 ( $736 \pm 457$  kcal;  $p < .05$ ). Fat ingestion (in grams) was significantly lower on CON ( $7.8 \pm 3.2$  g) compared with EX20 ( $10.3 \pm 4.6$  g;  $p < .01$ ). Protein intake (in grams) was higher on EX20 ( $37.0 \pm 16.6$  g) compared with both CON ( $29.5 \pm 11.7$  g;  $p < .01$ ) and EX40 ( $33.1 \pm 10.9$  g;  $p < .05$ ). However, the percentage of total energy derived from each macronutrient was not different between conditions. Obese adolescent girls do not compensate for an acute bout of exercise set at their ventilatory threshold by increasing energy intake, regardless of the exercise duration.

**KEYWORDS:** Food intake; Hunger; Pediatric obesity; Physical activity; Satiety.

## Manual therapy for unsettled, distressed and excessively crying infants: a systematic review and meta-analyses.

Dawn Carnes, Austin Plunkett, Julie Ellwood, Clare Miles  
*BMJ Open*, 2018;8:e019040. doi: [10.1136/bmjopen-2017-019040](https://doi.org/10.1136/bmjopen-2017-019040)

### ABSTRACT

**Objective:** To conduct a systematic review and meta-analyses to assess the effect of manual therapy interventions for healthy but unsettled, distressed and excessively crying infants and to provide information to help clinicians and parents inform decisions about care. **Methods:** We reviewed published peer-reviewed primary research articles in the last 26 years from nine databases (Medline Ovid, Embase, Web of Science, Physiotherapy Evidence Database, Osteopathic Medicine Digital Repository, Cochrane (all databases), Index of Chiropractic Literature, Open Access Theses and Dissertations and Cumulative Index to Nursing and Allied Health Literature). Our inclusion criteria were: manual therapy (by regulated or registered professionals) of unsettled, distressed and excessively crying infants who were otherwise healthy and treated in a primary care setting. Outcomes of interest were: crying, feeding, sleep, parent-child relations, parent experience/satisfaction and parent-reported global change. **Results:** Nineteen studies were selected for full review: seven randomised controlled trials, seven case series, three cohort studies, one service evaluation study and one qualitative study. We found moderate strength evidence for the effectiveness of manual therapy on: reduction in crying time (favourable:  $-1.27$  hours per day (95% CI  $-2.19$  to  $-0.36$ )), sleep (inconclusive), parent-child relations (inconclusive) and global improvement (no effect). The risk of reported adverse events was low: seven non-serious events per 1000 infants exposed to manual therapy ( $n=1308$ ) and 110 per 1000 in those not exposed. **Conclusions:** Some small benefits were found, but whether these are meaningful to parents remains unclear as does the mechanisms of action. Manual therapy appears relatively safe.



## Effect of maternal pre-pregnancy BMI and weekly gestational weight gain on the development of infants.

Chao Li, Lingxia Zeng, Duolao Wang, Shaonong Dang, Tao Chen, Victoria Watson and Hong Yan  
*Nutrition Journal*, 2019;18:6 <https://doi.org/10.1186/s12937-019-0432-8>.

### ABSTRACT

**OBJECTIVE:** The aim of the present study is to identify the average effect across different time points and to specify the time effects of maternal pre-pregnancy BMI and weekly gestational weight gain on the mental development and physical growth of infants. **METHODS:** The present cohort study used a repeated measures study design that began in 2004 with follow up at 3, 6, 12, 18, and 24 months of age. The participants were a subset from a controlled, cluster-randomized, double-blind trial. Bayley Scales of Infant Development (BSID) were used to estimate the mental development of infants. A generalized estimating equation linear model was used to estimate the effects of maternal BMI and weight gain. **RESULTS:** The average effect of maternal BMI and weight gain on the weight for age Z scores (WAZ), length for age Z scores (LAZ) and mental development index (MDI) across the different time points of infants was significant. In addition, the maternal BMI and weight gain were positively and significantly associated with the WAZ and LAZ in infants of different ages. However, the effect of weekly gestational weight gain was significant only during the earlier period of life (3 months, Coefficient: 11.15, 95%CI: 4.89-17.41). **CONCLUSIONS:** Our results indicate positive effects of pre-pregnancy and prenatal nutrition on the physical growth of infants. Weekly gestational weight gain of the pregnant women had a positive effect on the mental development of the infants, but this effect appears to decline over time.

**KEYWORDS:** Development of infants; Maternal pre-pregnancy BMI; Weekly gestational weight gain.

## The Effect of Stabilization Exercises on Pain, Disability, and Pelvic Floor Muscle Function in Postpartum Lumbopelvic Pain: A Randomized Controlled Trial.

Teymuri Z, Hosseinfar M, Sirousi M  
*Am J Phys Med Rehabil.*, 2018 Dec;97(12):885-891. doi: [10.1097/PHM.0000000000000993](https://doi.org/10.1097/PHM.0000000000000993).

### ABSTRACT

**OBJECTIVE:** The effect of stabilization exercises on pain, disability, and pelvic floor muscle function in postpartum lumbopelvic pain. **DESIGN:** This is a single-blind, randomized controlled trial. **SETTING:** This study was performed at the physiotherapy clinic, Zahedan University of Medical Science, from January to November 2017. **PARTICIPANTS:** Thirty-six multiparous women with persistent postpartum lumbopelvic pain were recruited at least 3 mos after delivery. **INTERVENTIONS:** Subjects in the training group (n = 18) received electrotherapy modalities and specific stabilizing exercises. The control group (n = 18) received only electrotherapy modalities. **MAIN OUTCOME MEASURES:** Pain, disability, and bladder base displacement (at rest and pelvic floor muscles contraction) were measured through visual analog scale, Oswestry Disability Index questionnaires, and transabdominal ultrasound imaging respectively at baseline and after 6 wks of intervention. **RESULTS:** Between-groups comparison showed significant improvement in pain, disability, and bladder base displacement in the training group ( $P < 0.05$ ). In within-group comparison, training group had significant difference for all variables ( $P < 0.05$ ). In the control group, pain and disability had significant difference ( $P < 0.05$ ), whereas bladder base displacement had no significant change ( $P < 0.05$ ). **CONCLUSIONS:** The stabilizing exercises can remarkably improve pain, disability, and pelvic floor muscles function in postpartum lumbopelvic pain.

Clinical Trial Registry: NCT03030846.

## Screen media activity and brain structure in youth: Evidence for diverse structural correlation networks from the ABCD study.

Paulus MP, Squeglia LM, Bagot K, Jacobus J, Kuplicki R, Breslin FJ, Bodurka J, Morris AS, Thompson WK, Bartsch H, Tapert SF. *Neuroimage*, 2019 Jan 15;185:140-153. doi: [10.1016/j.neuroimage.2018.10.040](https://doi.org/10.1016/j.neuroimage.2018.10.040). Epub 2018 Oct 16.

### ABSTRACT

The adolescent brain undergoes profound structural changes which is influenced by many factors. Screen media activity (SMA; e.g., watching television or videos, playing video games, or using social media) is a common recreational activity in children and adolescents; however, its effect on brain structure is not well understood. A multivariate approach with the first cross-sectional data release from the Adolescent Brain Cognitive Development (ABCD) study was used to test the maturational coupling hypothesis, i.e. the notion that coordinated patterns of structural change related to specific behaviors. Moreover, the utility of this approach was tested by determining the association between these structural correlation networks and psychopathology or cognition. ABCD participants with usable structural imaging and SMA data (N = 4277 of 4524) were subjected to a Group Factor Analysis (GFA) to identify latent variables that relate SMA to cortical thickness, sulcal depth, and gray matter volume. Subject scores from these latent variables were used in generalized linear mixed-effect models to investigate associations between SMA and internalizing and externalizing psychopathology, as well as fluid and crystallized intelligence. Four SMA-related GFAs explained 37% of the variance between SMA and structural brain indices. SMA-related GFAs correlated with brain areas that support homologous functions. Some but not all SMA-related factors corresponded with higher externalizing (Cohen's d effect size (ES) 0.06-0.1) but not internalizing psychopathology and lower crystallized (ES: 0.08-0.1) and fluid intelligence (ES: 0.04-0.09). Taken together, these findings support the notion of SMA related maturational coupling or structural correlation networks in the brain and provides evidence that individual differences of these networks have mixed consequences for psychopathology and cognitive performance.

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