



Complementary and Alternative Medicine Use by Children With Pain in the United States

Cornelius B. Groenewald, MBChB; Sarah E. Beals-Erickson, PhD;
Jaime Ralston-Wilson, DAOM, LAc; Jennifer A. Rabbitts, MBChB; Tonya M. Palermo, PhD

From the Departments of Anesthesiology and Pain Medicine (Drs Groenewald, Ralston-Wilson, Rabbitts, and Palermo), Pediatrics (Dr Palermo) and Psychiatry (Dr Palermo), University of Washington School of Medicine and Seattle Children's Hospital, and Center for Child Health, Behavior, and Development, Seattle Children's Research Institute (Dr Beals-Erickson), Seattle, Wash

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Address correspondence to Cornelius B. Groenewald, MBChB, Anesthesiology and Pain Medicine, Seattle Children's Hospital, M/S MB.11.500.3, 4800 Sand Point Way NE, Seattle, WA 98105 (e-mail: Cornelius.groenewald@seattlechildrens.org).

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ABSTRACT

OBJECTIVE: Chronic pain is reported by 15% to 25% of children. Growing evidence from clinical samples suggests that complementary and alternative medicine (CAM) therapies are desired by families and may benefit some children with pain conditions. The objective of this study was to provide estimates of CAM use by children with pain in the United States.

METHODS: We analyzed data from the 2012 National Health Interview Survey (NHIS) to estimate patterns, predictors, and perceived benefits of CAM use among children 4 to 17 years of age with and without painful conditions in the United States. We used chi-square tests to compare the prevalence rates of CAM use among children with pain to CAM use among children without pain. Multivariable logistic regression was used to examine factors associated with CAM use within the group of children with pain conditions.

RESULTS: Parents reported that 26.6% of children had pain conditions (eg, headache, abdominal, musculoskeletal pain) in

the past year; of these children, 21.3% used CAM. In contrast, only 8.1% of children without pain conditions used CAM (χ^2 , $P < .001$). CAM use among children with pain was associated with female sex (adjusted odds ratio [aOR] = 1.49, $P = .005$), higher income (aOR = 1.61, $P = .027$), and presence of 4+ comorbidities (aOR = 2.01, $P = .013$). Among children with pain who used CAM, the 2 most commonly used CAM modalities were biology-based therapies (47.3%) (eg, special diets and herbal supplements) and manipulative or body-based therapies (46.3%) (eg, chiropractic and massage).

CONCLUSIONS: CAM is frequently used by children with pain in the United States, and many parents report benefits for their child's symptoms.

KEYWORDS: complementary and alternative medicine; integrative medicine; pain

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WHAT'S NEW

The current epidemiology of complementary and alternative medicine (CAM) use by children with pain is unknown. Overall, 26.6% of children in the United States have pain. Children with pain were much more likely to use CAM therapies compared to children without pain.

PEDIATRIC PAIN IS a significant public health concern. Pain affects 15% to 25% of children in the United States, and economic expenditures on pediatric pain are estimated at around \$11.5 billion annually.^{1,2} Evidence suggests that complementary and alternative medicine (CAM) therapies may be effective for treating pain.^{3,4} However, the prevalence, patterns, and perceived benefits of CAM use by children with pain in the United States are unknown.

The 2007 National Health Interview Survey (NHIS) estimated that approximately 11.8% of children in the United States use CAM for treating a variety of symptoms

and health conditions, including back or neck pain (6.7%) and other musculoskeletal problems (4.2%).⁵ Hospital pediatric pain management programs often offer 1 or more CAM approaches for patients,⁶ and many pediatric providers discuss or recommend a CAM approach to their patients.⁷ Thus far, 2 studies have explored the use of CAM and attitudes toward CAM in multidisciplinary pediatric pain clinics: Vinson et al³ found that a significant portion of their patients (42%) had previously tried a CAM modality before attending a pain clinic, while in another study,⁴ in a sample of children presenting to pain clinic for initial assessment, the majority of patients (61.2%) elected to include a CAM approach as part of their treatment plan.

While these studies provide estimates of CAM utilization in clinical samples of children with pain, no large nationally representative studies have yet been published on CAM use by children with pain in the United States. This is a major gap in knowledge because a better understanding of patterns, predictors, and perceived benefits of CAM use may allow clinicians and health care policy

makers to understand the demand for these modalities and to more widely incorporate CAM within conventional treatment approaches.

Therefore, the primary aim of this study was to compare prevalence rates of CAM use among children with pain conditions to children without pain conditions in the United States. Our primary hypothesis was that rates of CAM use would be higher in children with pain conditions compared to children without pain conditions. The secondary aims of this study were to determine, among children with pain, which CAM therapies were used most often; which factors were associated with CAM use; and perceived benefits of and reasons associated with CAM use. We hypothesized that among children with pain, CAM use would be associated with higher income, private health insurance, and female sex. Furthermore, we expected to find that children with pain would report benefit from using CAM.

METHODS

PARTICIPANTS AND PROCEDURE

For this cross-sectional analysis, we used data from the 2012 NHIS. The NHIS is an annually conducted set of cross-sectional surveys intended to provide nationally representative data on the health and health care utilization of the civilian, noninstitutionalized child and adult population in the United States. NHIS uses a complex, multistage sample design with oversampling of minorities. By applying survey weights, estimates are representative of the United States population. The 2012 version of the NHIS was accompanied by a child complementary and alternative medicine supplement (NHIS-CAM). This supplement is not available with later years of NHIS. Funding for NHIS-CAM was provided by the National Center for Complementary and Integrative Health (NCCIH) of the National Institutes of Health. Data collection and management for NHIS-CAM was conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention. NHIS-CAM was designed to collect information on 34 CAM health services, products, and practices commonly used in the United States. Further information about NHIS and NHIS-CAM is available online.⁸ The 2012 NHIS-CAM contained data on 10,281 children 4 to 17 years of age (parents of children 0 to 3 years of age were not asked about CAM use). We extracted variables related to CAM use, pain-related conditions, and sociodemographic background information. Because all data are publicly available, this study was deemed exempt from review by the institutional review board at Seattle Children's Hospital.

MEASURES

CAM Use

The 2012 NHIS-CAM asked parents whether their child used or saw a provider for the following CAM therapies over the preceding 12 months: acupuncture, Ayurveda, biofeedback, chelation therapy, chiropractic and osteo-

pathic manipulation, craniosacral therapy, special diets (Atkins, macrobiotic, Pritkin, Ornish, vegan/vegetarian), energy therapy, herbal or nonvitamin supplements, homeopathic medicine, hypnosis, massage therapy, naturopathy, movement or exercise techniques (Alexander technique, Feldenkrais, Pilates, Trager psychophysical integration), guided imagery, homeopathy, meditation (mantra, mindfulness, spiritual), progressive relaxation, qi gong, tai chi, traditional healers, and yoga. In addition to these CAM therapies, NHIS-CAM also includes data on vitamins and minerals; however, for this study, we excluded data on vitamins and minerals because of a lack of specificity about their use among children and adolescents. The 2012 NHIS-CAM did not ask about prayer.

To ease interpretability and to maintain large enough sample sizes for comparative analyses, we categorized CAM modalities into 4 groups, as used by the NCCIH⁵: 1) alternative medical systems/energy healing therapies (acupuncture, Ayurveda, homeopathic medicine, naturopathy, traditional healers, energy healing therapy); 2) biology-based therapies (chelation therapy, herbal or nonvitamin supplements, special diets); 3) manipulative and body-based therapies (chiropractic and osteopathic manipulation, massage therapy, craniosacral therapy, movement or exercise techniques); and 4) mind-body therapies (biofeedback, hypnosis, meditation, guided imagery, progressive relaxation, yoga, tai chi, qi gong).⁵ Parents were asked to name the top 3 CAM modalities used by their children and to state whether these were used to treat specific health conditions or symptoms. The National Center for Health Statistics has previously analyzed data from the 2012 NHIS CAM and found that the most common indications for CAM in children included back or neck pain (8.8%), head or chest cold (6.5%), other musculoskeletal problems (5%), anxiety or stress (4.4%), attention-deficit/hyperactivity disorder (2.3%), and insomnia (2%).⁹

REASONS AND PERCEIVED BENEFITS ASSOCIATED WITH CAM USE

For each of the 3 top CAM modalities, parents were asked about the perceived benefits and reasons for CAM use. The specific perceived benefits and reasons for CAM use are listed in [Figures 1 and 2](#), respectively. For each of these variables, parents were asked to respond yes or no.

PARTICIPANTS WITH PAIN CONDITIONS

Children and adolescents with pain conditions were identified by parental responses to questions in the 2012 NHIS Sample Child file.¹ Parents were asked whether their child had any of the following pain conditions in the last 12 months: 1) frequent headaches or migraines, 2) recurrent headaches other than migraines, 3) abdominal pain, 4) pain in/around a joint over the past 30 days, 5) neck pain, 6) lower back pain, 7) other muscle or bone pain, 8) severe sprains or strains, 9) dental pain, or 10) other chronic pain. These pain conditions have previously been used in publications of data from NHIS.¹ While parents did not report

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