

## Complementary/alternative medicine in adolescents with attention deficit hyperactivity disorder and mood disorders

### Medicinas complementarias/alternativas en adolescentes con trastorno déficit atencional/hiperactividad y trastornos del ánimo

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#### Abstract

The Complementary/Alternative Medicine (CAM) have been increasingly used by patients such as children and adolescents. The Ministry of Health in Chile (MINSAL) has recognized and regulated some CAM, although there is still unknown their effectiveness and safety of these. **Objective:** Review the available evidence regarding the use of CAM in adolescents with the attention deficit hyperactivity syndrome (ADHD) and mood disorders. **Methodology:** A review of the related literature about this topic on PubMed, focus on the last 10 years and using as a keywords *Complementary/Alternative Medicine/Therapies, Attention deficit disorder with hyperactivity, Mood disorders, and Children/Adolescents*. The revision was also complemented with other sources of information. **Results:** Globally there has been a progressive increase in publications in relation to the CAM. However, not all studies follow a good methodology and the majority of the studies in adolescents show inconclusive results. The ADHD studies have shown benefits when using omega 3 fatty acids. Regarding other CAM and ADHD, the evidence does not show any favorable results beyond placebo. Though some of these studies have methodological mistakes or lack of enough studies, making it impossible to have conclusive. In mood disorders, there are several promising therapies, such as: physical exercise, light therapy, St. John's Wort and some kinds of meditation like Mindfulness. In Chile, there are still no studies in this age group, which makes important the development of a line of research in this area.

#### Keywords:

Complementary/  
Alternative Medicine/  
Therapies; Children/  
Adolescents;  
Attention deficit  
disorder with  
hyperactivity;  
Mood disorders

#### Introduction

Complementary/Alternative Medicine (CAM) are increasingly used by patients, including children and adolescents. There are different types of CAM, being

the vast majority of low cost and easy access<sup>1</sup>. The main reasons for their use are dissatisfaction with conventional medicine and the positive effect they have had on family and friends<sup>1</sup>.

Gradually, different CAM have been incorporated

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into health systems, and more professionals are practicing them. However, the effectiveness of many of them is still unclear.

Over the last few years, there has been a considerable increase in publications in this area. In 1991, there were published 2260 articles related to CAM. On the contrary, in 2011 this figure reached 9441<sup>2</sup>.

The objective of this article is to carry out a review of the available scientific evidence regarding the use of CAM in adolescents with ADHD and mood disorders and the situation in our country, in order to provide professionals with an updated vision of the effectiveness and safety of CAM.

## Methodology

The bibliographic search was performed in PubMed by conjugating the terms MESH, “Complementary therapies”, “children and adolescents”, “attention deficit disorder with hyperactivity” and “mood disorders”, with limits of English and Spanish language, published between January 2004 and August 2015. In addition, the search was extended to references. The selected papers were complemented with other sources of information considered relevant. It was also searched the information on the official website of the Chilean Ministry of Health ([www.minsal.cl](http://www.minsal.cl))<sup>3</sup>.

## Concepts in alternative medicine

Many times, there is confusion with the different terms used, such as traditional and non-traditional medicine, complementary and alternative, conventional or integrative, etc.

The World Health Organization (WHO) conceptualizes traditional medicine as “the total sum of knowledge and practices based on theories and experiences inherent to the different cultures, whether explicable or not, and which are used in the maintenance of health or in the prevention and treatment of diseases”<sup>4,5</sup>. For example, traditional Chinese medicine, Tibetan medicine or Ayurveda in India, Mapuche medicine in Chile, etc.<sup>6</sup>.

Conventional medicine is medicine considered as official or allopathic.

Complementary medicine is the one used together with conventional medicine.

Alternative medicine is the one used instead of conventional medicine.

Finally, there is the concept of integrative medicine, with a comprehensive approach of the patient. Both, the conventional Physician and the CAM therapist, know the therapy indicated by the other and they work

together as a team. In this case, CAM is integrated into the conventional health system<sup>6,7</sup>.

The Cochrane Collaboration defines CAM as a “broad set of therapeutic resources that includes all systems, modalities, health practices, theories and beliefs that accompany them, other than those intrinsic to the politically dominant health system of a particular society in a given historical period data”<sup>4,6</sup>.

## Epidemiology

A 2007 survey by the NCCIH (*National Center for Complementary and Integral Health*) showed that the most common CAM in children are natural products (17.7%), with echinacea and fish oil being the most used by adolescents (37.2% and 30.5%, respectively). Body/Mind Therapies occupied the second place, with therapies like deep breathing (12.7%) and meditation (9.4%); Followed by chiropractic and osteopathy (8.6%) and massages (8.3%)<sup>7,8</sup>.

## Situation in Chile

In 1992, the Ministry of Health of Chile (Minsal) created the “Unit of Traditional Medicine and Other Alternative Medical Practices”<sup>9</sup>. In 2005, Decree N°42 of the Health Code is dictated, which regulates the practice of alternative (complementary) medical practices as auxiliary health professions. So far, Acupuncture has been recognized (Decree N° 123 of 2008); Homeopathy (Decree N° 19 of 2010) and Naturopathy (Decree N° 5 of 2013)<sup>3</sup>.

At the public health level, CAM are being developed in both, primary care centers and hospitals, with 34.5% of establishments and 54% of the therapists in these places are health professionals.

In 2010, the Minsal conducts the first national survey of CAM, in charge of the Center of Studies of Citizen Opinion of the University of Talca. 2071 CAM therapists were surveyed<sup>11</sup>.

The most practiced therapies were: Floral therapy (56.3%), Reiki (48.3%), Reflexology 19.3%, Biomagnetism 15.9% and Aromatherapy 14.4%. Many CAM therapists practiced more than one type of therapy<sup>11</sup>.

Within the profile of the CAM therapist, 92.1% of the therapists had a higher education and/or professional technicians. Of these, only 37% corresponded to titles related to the health area (psychologists [9.6%] and health technicians [8.7%]). Among professions not related to health, the most frequent were teachers (8.8%). Of the 418 training entities mentioned in the survey, only 5.2% of professional institutes and/or uni-

versity technicians are recognized by Ministry of Education<sup>11</sup>.

Regarding the use of CAM, 55% of Chileans have used at least one type of CAM during their lifetime, regardless of age, sex, socioeconomic status, and foresight.

As for the reasons for consultation, the most frequent are emotional problems (56%), pain (26%), depression (24.8%) and stress (14.6%). 80.8% of the patients come to the therapist referred by another patient with CAM. In the case of physical ailments, the most common CAM were Acupuncture, Apitherapy, Chiropractic, Neural Therapy and Biomagnetism.

In the diagnosis made in 2012, in relation to the results of CAM therapies, the greatest achievements were the reduction of symptoms (19%), disease mitigation and/or remission (18.6%) and quality improvement of life and well-being (11.3%)<sup>10</sup>.

To date, there are no studies of CAM use in adolescent population in Chile. There is concern about Minimal and research lines are being developed, for example in Floral Therapy and ADHD.

## CAM and adolescents

The prevalence in children and adolescents of CAM use is between 20 and 40%, being greater than 50% in patients with chronic diseases (asthma, ADHD, autism, cancer, cerebral palsy, cystic fibrosis, inflammatory bowel disease, rheumatoid arthritis youth)<sup>12</sup>.

The main reasons for adolescents to use CAM are: word of mouth; why a particular treatment is considered effective, fears of the adverse effects of drugs, dissatisfaction with conventional medicine and the need for more personal attention<sup>12</sup>.

The use of CAM is more frequent in children whom parents have used CAM. By contrast, adolescents are more open than their parents to these types of therapies<sup>12</sup>.

Around 66% of parents/caregivers do not advise the pediatrician that they are using some type of CAM in parallel<sup>12</sup>, which reflects the importance of asking about their use, since some may have interactions or adverse effects when used together with other therapies.

In 2007, the National Health Interview Survey NHI NCCAM surveyed 5651 adolescents with ADHD, anxiety and depression (representing 7 million young people). In this group of patients, the use of CAM was 28.9% versus 11.6% of the general population ( $p < 0.05$ ). When comparing both groups of pathologies, it was observed that 34.8% of patients with anxiety/depression used some type of CAM versus 24.7% of patients with ADHD ( $p < 0.05$ ). The CAM most used

by these patients were: Therapies mind/body (16.3%), Biological therapies (11%), Therapies based on body manipulation (8.5%)<sup>13</sup>.

In this study, we also studied factors related to the use of CAM; Where the highest educational level of the parents was positive OR: 3.04 [1.7-5.26], have another chronic condition OR: 2.19 [1.21- 3.97], use of medical prescriptions OR: 1.8 [1.18-3.24], difficulty paying consultation Mental health OR: 2.63 [1.35-5.11]<sup>13</sup>.

A German review of the use of CAM in adolescents conducted a search for published studies between 1995 and 2012. There were found 4875 studies, of which 1379 were studies in children, of these 170 were chosen, of which 35 were excluded because they used some kind of conventional therapy. Finally, 135 studies met inclusion criteria. The 57% of the studies selected were conducted in England, Australia and China. The most common CAMs in adolescents were herbs, homeopathy, reflexology, and acupuncture<sup>14</sup>.

Of these 135 studies, 3.7% (5/135) concluded a recommendation in favor of the intervention with CAM, 19.4% made a positive conditional recommendation; 6.6% (9/135) recommended that certain interventions should not be performed. It is striking that 70.3% of the studies were inconclusive<sup>14</sup>. Similar results have been found in other studies<sup>15</sup>.

It was also observed that the proportion of un-concluded studies has been increasing in recent times, being 55.6% between 1995-2000; and 73.4% between 2007 and 2012<sup>14</sup>.

When analyzing the main reasons for the deficiencies of these studies and the high percentage of inconclusive studies, it was seen that in 60.7% more studies were necessary; 42.2% were of low methodological quality; 35.6% had a small number of patients and in 21.5% the data were insufficient<sup>14</sup>.

Regarding the types of CAM studies in children and adolescents, a review by Snyder et al, selected 111 studies published in Pubmed during 2011. The most studied pathologies were pain, headache, ADHD, asthma and colic. The majority of the studies corresponded to reviews, case reports and studies of low methodological quality. It was observed that the most frequent CAM used in children and Adolescents were the herbs (28%), within this group the observational studies were 29%, RCTs 26% and systematic reviews 10%; Second was acupuncture with 26% (observational 17%, RCT 45% and systematic reviews 17%); Thirdly massages with 9% (systematic reviews 20% and 40% of RCT); Chiropractic with 5% (only one study of good methodological quality was found); Finally, homeopathy with 5% (only studies of low methodological quality)<sup>16</sup>.

Hunt et al., selected 20 systematic reviews published in 2009 related to CAM and children. Some

examples of the results of this study point out that in acupuncture we found 24 RCTs, observing benefits in the management of post-surgery, nausea and vomiting. In chiropractic, there was insufficient evidence. Within the medicinal herbs, two studies were found with Echinacea for cold management, one in favor and another that did not show significant differences. With regard to homeopathy, there were 2 systematic reviews with beneficial results regarding the management of diarrhea in children and in ADHD, although it must be considered that the 3 studies on the management of diarrhea with homeopathy incorporated in the systematic review analyzed were performed by the same author of the review. In ADHD, 2 of the 3 RCTs showed positive results. A systematic review of hypnosis, which included 13 RCTs, showed consistent evidence of effectiveness in managing pain related to pediatric procedures. In relation to massages, two Cochrane reviews have shown effectiveness in the promotion of mental and physical health, but in children younger than 6 months. Finally, with respect to yoga we selected a systematic review that included 24 RCTs, 6 RCTs showed improved memory and concentration. However, it was difficult to obtain conclusions, due to the heterogeneity of the studies, the different techniques of yoga used and the lack of rigor of the designs used<sup>17</sup>.

## ADHD and mood disorders

In the clinical care of adolescent patients, it is common to find that in our country CAM are frequently used in pathologies such as ADHD and mood disorders

### Attention Deficit Hyperactivity Disorder (ADHD)

Often parents of young people with ADHD do not want to use psychostimulant drugs for fear of being labeled, adverse effects or belief that they will become “addicted”, so they look for other alternatives as treatment, within which is CAM.

In adolescents with ADHD, the use of nutritional supplements is 10% more likely than in adolescents without ADHD<sup>18</sup>.

A review published by Bloch & Mulqueen on the use of nutritional supplements in the treatment of ADHD published in 2014 concluded that the use of omega-3 fatty acids (dose 1 to 2 g/day) had evidence level 1 support (based on systematic reviews of RCT). The use of melatonin was categorized as level 2 of evidence (based on RCT studies), demonstrating efficacy in the management of sleep disorders related to ADHD, but without clinical improvement in relation to the symptoms of ADHD. The use of supplements

with minerals such as zinc and iron has shown benefits in patients with deficits of these nutrients (level 3 of evidence). They have found some studies that report some improvement with the use of pycnogenol (product derived from pine bark) and with ningdong (granules that are used in traditional Chinese medicine); however, their mechanisms of action are unknown and other studies are lack of credibility<sup>19</sup>.

With regard to St. John's wort, L-carnitine and ginkgo biloba, there is no evidence to support its use in these patients and their use is discouraged because of the potential adverse effects these products could cause<sup>19</sup>.

Other CAM have not demonstrated their usefulness in the management of adolescents with ADHD, such as Acupuncture. A Cochrane review published in 2011, where an extensive search was conducted in several databases, did not find quality studies to be included in the review of this topic<sup>20</sup>.

Regarding to Bach Flowers and ADHD, there is no scientific evidence to show that it is superior to placebo. A systematic review on the use of floral therapy in different pathologies, included a study where the use of Bach flowers in 40 patients between 7 and 11 years with ADHD was analyzed, the use of Rescue Remedy was evaluated for 3 months and the use of Conner's test to evaluate changes. There were no significant differences regarding the use of placebo, it can be considered that the study had a 42% loss<sup>21</sup>.

In general, conclusions about the effectiveness of meditation therapies for ADHD have not been established. In a 2010 Cochrane review there were no significant differences between meditation and standard treatment, however the number of studies was limited (only 4 studies) and the size of small samples, having a high risk of bias. The adverse effects of meditation have not been reported. Further testing is needed<sup>22</sup>.

### Mood Disorders

The use of CAM antidepressants is becoming more frequent, since they are cheaper, with fewer adverse effects (except St. John's wort) and generate fewer stigmas.

A review done in 2014 by Popper, analyzed the evidence for the use of CAM in mood disorders in adolescents. 5 RCTs showed benefits of physical exercise for these patients, with an SMD effect size of 0.6 ( $p = 0.03$ ). However, too much exercise could facilitate certain types of psychopathology<sup>23</sup>.

Light therapy, in several studies (4 RCTs and 4 open clinical trials), has shown a positive effect on mood symptoms in patients with seasonal depression and using bright light in the box. Although more studies are needed given the small number of patients included<sup>23</sup>.

St. John's wort has effects at the level of serotonin, norepinephrine and dopamine, and has shown benefits in the treatment of depression<sup>23</sup>. This herb induces cytochrome p450, so be aware of the potential adverse effects (similar to other SSRIs and Sd. Serotonergic, among others) and interactions with other medicines, in this sense it is important to warn the Adolescents women use this herb in conjunction with oral contraceptives, which could have a decrease in their effectiveness<sup>24,25</sup>.

In relation to body/mind therapies, a type of mindfulness meditation has shown beneficial effects in different types of pathologies, such as handling stress, depression, anxiety, borderline personality disorder, among others. Various studies have shown changes at the neurobiological level and no adverse effects have been reported with this type of practice<sup>24</sup>.

### Analysis of evidence available

In the current literature, worldwide, there is a great deal of evidence (especially in the last 10 years) that supports CAM studies with methodological rigor (poor design, insufficient samples, biases, inconclusive results) and those that are well designed do not conclude results that support the effectiveness of the different CAM.

CAM studies often analyze several types of interventions at the same time, making it impossible to know the actual effect of each of them separately. Neither the adherence to each therapy over time nor the adverse effects or interactions that may have with other types of therapies or drugs are reported.

Each year, more CAM studies are published, but more studies are missing in the youth population. In this regard, it is important to have studies in Chile that evaluate the most used therapies in our country, since they do not necessarily coincide with therapies used in other countries, and evidence of good quality is needed to support their use.

Some considerations to keep in mind is that not necessarily the use of CAM is synonymous with harmless. Some therapies can have side effects. Also that the simultaneous is not always synergic (for example the use of St. John's Wort with anti-depressants IRSS), and finally the use of CAM will not always be of lower cost than the use of conventional medicine.

It is essential, that there is regulation with respect to the production of supplements and herbs used as CAM. In our country, it is common that several products are sold without supervision of the ISP or organisms like the FDA. In this sense, it is important to have studies of efficacy, pharmacokinetics and cost-effectiveness that can help make decisions in public

policies and that can demonstrate safety and efficacy of these products in the population.

Another point to consider is the ethical-legal framework of these therapies, which has

Been discussed in other countries.

### Discussion

Increasingly, CAM are being used by more patients. This due to their accessibility, less expensive than conventional treatments, and promising results, which are often not supported by scientific evidence.

These CAM respond to a set of needs that are not being met by current conventional medicine. It is crucial to reflect on the model of care we have been using so far and the importance of being able to provide an integral model of care, with a more holistic view of the patient and his illness, which is what many of these therapies point out.

It is necessary for professionals to ask their patients about the parallel use of these therapies, since the vast majorities do not spontaneously report the use of CAM, and in occasions they may have adverse effects or interactions with other treatments. The physician/pediatrician should have an educator role and be able to inform his/her patients about the use of CAM.

When considering the use of CAM within the therapeutic arsenal, it is essential to make a risk analysis versus the benefit conferred by each therapy, and in turn, compared to conventional medicine, the quality of the evidence that exists about it, adverse effects, among other. In this sense, every time we face an CAM it is essential to answer 3 questions: Is it safe? Is it effective? Is it quality?

In Chile, Minsal has been incorporating some CAM as auxiliary health professions. However, it is important that there is a permanent regulation, both in clinical practice and in the professionals that exercise the different CAM, and in the institutions that teach this type of therapy.

It is interesting to ask why CAM are generating so much impact in our society, which leads us to emphasize the importance of an integral model of care, encompassing both physical, psychological/emotional, social and spiritual dimensions, in order to understand and respond in a better way to each adolescent and provide a safe, effective and quality care.

### Ethical Responsibilities

**Human Beings and animals protection:** Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

**Data confidentiality:** The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

**Rights to privacy and informed consent:** The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the correspondence author.

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## Conflicts of Interest

Authors state that any conflict of interest exists regards the present study.

## References

- Subsecretaria de Salud Pública, División de Políticas Públicas Saludables y Promoción. Minsal. Estudio sobre conocimiento, utilización y grado de satisfacción de la población chilena en relación a las Medicinas Complementarias Alternativas. Agosto, 2012. En <http://web.minsal.cl/portal/url/item/cdc107bdcfa7bfff6e040010164015ba5.docx> (Última visita el 1 de diciembre de 2015).
- Italia S, Wolfenstetter S, Teuner C. Patterns of Complementary and Alternative Medicine (CAM) use in children: a systematic review. *Eur J Pediatr.* 2014;173:1413-28.
- Minsal. Medicina Complementarias-Alternativas. En [http://web2.minsal.cl/medicinas\\_complementarias](http://web2.minsal.cl/medicinas_complementarias). (Última visita el 14 de diciembre de 2015).
- Nogales J. Medicina Complementaria y Alternativa. *Rev Chil Neuro-Psiquiat.* 2004;42(4):243-50.
- Estrategia de la OMS sobre la medicina tradicional 2002-2005. Ginebra: OMS; 2002. En [http://apps.who.int/iris/bitstream/10665/67314/1/WHO\\_EDM\\_TRM\\_2002.1\\_spa.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/67314/1/WHO_EDM_TRM_2002.1_spa.pdf?ua=1) (Última visita el 8 de diciembre de 2015).
- Flores A, Arias L, Azolas X, et al. Dolor y Medicina Complementaria y Acupuntura. *Rev. Med. Clin. Condes.* 2014;25(4):636-40.
- ¿Qué es la medicina complementaria y alternativa?. National Center for Complementary and Alternative Medicine, NCCAM. En [https://nccih.nih.gov/sites/nccam.nih.gov/files/CAM\\_Basics\\_What\\_Are\\_CAIHA\\_SPANI\\_SH\\_02-18-2015.pdf](https://nccih.nih.gov/sites/nccam.nih.gov/files/CAM_Basics_What_Are_CAIHA_SPANI_SH_02-18-2015.pdf) (Última visita el 13 de diciembre de 2015).
- Barnes PM, Bloom B., Nahim RL. Complementary and Alternative Medicine use among adults and children United States, 2007. CDC National Health Statistics Report #12, 2008.
- Centro Estudios para la Calidad de Vida. Informe Final Estudio "Uso de Medicinas Complementarias/ Alternativas en la Red Asistencial del Sistema Nacional de Servicios de Salud", Minsal, Mayo 2012. En: <http://web.minsal.cl/portal/url/item/cdc107bdcfa7bfff6e040010164015ba5.doc> (Última visita el 14 de diciembre de 2015).
- Leighton A, Monsalve D. Estudio para Validar un Protocolo de Implementación de Terapias Complementarias/Alternativas en la Red Asistencial, Minsal. Julio 2013. En <http://web.minsal.cl/portal/url/item/e57ce75c16bc936e04001016501534f.pdf> (Última visita el 14 de diciembre de 2015).
- CEOC, Universidad de Talca. Diagnóstico Situacional de Medicinas Complementarias Alternativas en el país, Diciembre 2010. En <http://web.minsal.cl/portal/url/item/9d59798fb7dcbfae04001011f0139a0.pdf> (Última visita el 14 de diciembre de 2015).
- Kemper K, Vohra S, Walls R, the Task Force on Complementary and Alternative Medicine, the Provisional Section on Complementary, Holistic, and Integrative Medicine. The Use of Complementary and Alternative Medicine in Pediatrics. *Pediatrics.* 2008;122:1374-86.
- Kemper K, Gardiner P, Birdee G. Use of Complementary and Alternative Medical (CAM) Therapies Among Youth with Mental Health Concerns. *Acad Pediatr.* 2013;13(6):540-5.
- Meyer S, Gortner L, Larsen A, et al. Complementary and alternative medicine in paediatrics: a systematic overview/synthesis of Cochrane Collaboration reviews. *Swiss Med Wkly.* 2013;143:w13794.
- Meyer S, Schroeder N, Wilhelm C, Gortner L, Girisch W. Clinical recommendations of Cochrane reviews in three different fields of pediatrics (neonatology, neuropediatrics, and complementary and alternative medicine): A systematic analysis. *Pediatrics International.* 2013;55:396-8.
- Snyder J, Brown P. Complementary and alternative medicine in children: an analysis of the recent literature. *Curr Opin Pediatr.* 2012;24:539-46.
- Hunt K, Ernst E. The evidence-base for complementary medicine in children: a critical overview of systematic reviews. *Arch Dis Child.* 2011;96:769-776.
- Gardiner P, Buettnner C, Davis RB, et al. Factors and common conditions associated with adolescent dietary supplement use: an analysis of the National Health and Nutrition Examination Survey (NHANES). *BMC Complement Altern Med.* 2008;8:9.
- Bloch MH, Mulqueen J. Nutritional Supplements for the Treatment of ADHD. *Child Adolesc Psychiatric Clin N Am.* 2014;23:883-97.
- Li S, Yu B, Zhou D, et al. Acupuncture for Attention Deficit Hyperactivity Disorder (ADHD) in children and adolescents. *Cochrane Database of Systematic Reviews* 2011, Issue 4.
- Ernst E. Bach Flower Remedies: a systematic review of randomized clinical trials. *Swiss Med Wkly.* 2010;140:w13079.
- Krisanaprakornkit T, Ngamjarus C, Witoonchart C, Piyavhatkul N. Meditation therapies for attention-deficit/hyperactivity disorder (ADHD). *Cochrane Database of Systematic Reviews* 2010, Issue 6.
- Popper CW. Mood Disorders in Youth Exercise, Light Therapy, and Pharmacologic Complementary and Integrative Approaches. *Child Adolesc Psychiatric Clin N Am.* 2013;22:403-41.
- Simkin D, Black N. Meditation and Mindfulness in Clinical Practice. *Child Adolesc Psychiatric Clin N Am.* 2014;23:487-534.
- Kallapiran K, Koo S, Kirubakaran R. Review: Effectiveness of mindfulness in improving mental health symptoms of children and adolescents: a meta-analysis. *Hancock Child and Adolescent Mental Health* 2015;20(4):182-94.
- Gilmour J, Harrison C, Cohen M, Vohra S. Pediatric Use of Complementary and Alternative Medicine: Legal, Ethical, and Clinical Issues in Decision-Making. 2011; 128: S149-54.