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Practical Applications of Complementary and Alternative Therapies in Adults and Youth with Anxiety Disorders

Sarosh Khalid-Khan, Faiza Khalid-Khan and David Gratzer

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<http://dx.doi.org/10.5772/61046>

Abstract

The use of complementary and alternative medicine (CAM) therapies is becoming an increasingly popular treatment option for anxiety disorders in adults and youth. Parents often are reluctant to use antidepressants due to fear of potential side effects. Youth are often unwilling to participate in cognitive behaviour therapy (CBT) or it is not readily available. Practitioners are not always knowledgeable or open to considering CAM therapies for their patients. This chapter will review the definition of CAM, prevalence of CAM use, its safety and effectiveness and finally its practical applications. Four case studies are discussed in which practitioners were open to the use of CAM and collaborated successfully with parents of youth with anxiety disorders. Literature review is presented for use of vitamin D, melatonin, acupuncture, acupressure and craniosacral therapy.

Keywords: Complementary therapies, alternative therapy, youth adults, anxiety disorders

1. Introduction

The use of complementary and alternative medicine (CAM) therapies is becoming an increasingly popular treatment option for anxiety disorders. In this chapter, we will review the

emerging evidence in the West for CAM therapies commonly used in adults and children to treat anxiety disorders focusing in particular on acupuncture, naturopathy and body-based therapies. We will also consider how the widespread use and acceptance of CAM therapies will impact conventional psychiatric practice. Patients rarely disclose CAM use to physicians and, although physicians recognize patient's interest in CAM, they often do not feel comfortable asking about, discussing or recommending these treatments, due to a lack of knowledge about their effectiveness and safety [1].

Anxiety disorders are amongst the most common psychiatric disorders for both adults and children and include a number of conditions such as panic disorder, phobias, obsessive-compulsive disorder (OCD), generalized anxiety disorder, post-traumatic stress disorder and anxiety disorder due to a general medical condition. The prevalence of anxiety disorders is 3–18% worldwide [2]. The most prevalent condition according to the Office for National Statistics is mixed anxiety and depression [3]. Conventional treatment of these conditions involves antidepressants and cognitive behavior therapy (CBT). These treatments have limitations: antidepressants have been associated with adverse effects and poor adherence while CBT is not widely available. Consequently, patients are turning to CAM treatments. Anxiety, depression and stress were among the most common reasons for seeking CAM therapies in the United Kingdom [4]. Similar findings were reported in the United States and Canada [5, 12]. In 1997, 42% of American adults reported using CAM with 629 million visits to CAM practitioners, exceeding substantially the total visits (386 million) to primary care physicians that year [6].

Despite the inconclusive data on the efficacy and safety of many CAM treatments, there is enough evidence on certain treatments to be useful for researchers and clinicians. In light of the current literature, "it is perhaps helpful to remember that excessive skepticism as well as excessive enthusiasm can stand in the way of patient care" [7]. The low stigma and low costs of many forms of CAM, especially in comparison to many conventional psychiatric treatments, make them popular options for patients and thus clinicians should educate themselves about these treatments. The challenge to individual physicians is whether and how to participate in the emergence of CAM treatments in psychiatry. With more than a third of their patients already using natural remedies, an important question is: will physicians view CAM therapies as a conflict and dismiss their use or view them as an opportunity to expand their repertoire of these treatments?

2. What Is CAM?

CAM is not simple to define due to the variety of healing approaches and therapies that are included under its umbrella. Many aspects of CAM are rooted in Eastern healing practices such as those of China, India, and Africa and have been practiced for thousands of years. Often, it is difficult to distinguish between CAM and conventional medicine due to some CAM therapies that have become a part of conventional practice. For example, physical exercise as a treatment for many diseases might have been considered unconventional 50 years ago, but exercise is now known to benefit many medical as well as psychological conditions. There are

a number of other examples of treatments that were unconventional but converted to standard practice once research confirmed their efficacy. The term Integrative Medicine was introduced to include all treatment options that are safe and effective, regardless of their origin. All safe and effective treatments should be used by practitioners, so it is often difficult to define what lies outside of conventional medicine. Another example includes the established use of CBT and mindfulness to treat anxiety and depression which were considered unconventional 20 years ago. By definition, most CAM treatments are not established. As more research is conducted, some CAM therapies that show promise in preliminary research will become part of established care and therefore will no longer be considered “alternative” [7].

Although the difference between conventional medicine and alternative medicine is not always easy to distinguish, a basic philosophic difference exists. Conventional medicine is used to treat symptoms and traditional medicine to restore the body to its natural balance [1]. Conventional medicine generally defines health as the absence of disease or dysfunction. The main causes of disease and dysfunction are usually considered to be isolated factors, such as bacteria or viruses, biochemical imbalances, and aging and treatment often involves drugs or surgery. In contrast, alternative medicine practices often define health holistically, that is, as a balance of systems – physical, emotional and spiritual involving the whole person. Disharmony among these systems is thought to cause illness. Treatment involves strengthening the body’s own defenses and restoring these balances.

The National Center for Complementary and Alternative Medicine defines CAM as “a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine....Complementary medicine refers to the use of CAM together with conventional medicine and alternative medicine refers to the use of CAM in place of conventional medicine.....” [8].

There are five categories of CAM:

1. Alternative medical systems (Ayurveda, naturopathy, homeopathy, acupuncture Chinese/Oriental medicine),
2. Biologically based therapies (vitamins, herbs, special diets),
3. Mind–body therapies (meditation, biofeedback, hypnosis, imagery, prayer),
4. Energy healing, (Reiki, electromagnetic-based therapies), and manipulative and
5. Body-based therapies (chiropractic, massage, craniosacral therapy) [8].

3. Prevalence of CAM use

The use of CAM has been increasing for decades both worldwide [9] and in the United States, specifically [10], and it currently remains in the 25-50% range [11]. Both Canada and United States are similar with regard to prevalence of CAM use [12]. In 2008, it was reported that 38% of adults over the age of 18 years used some form of CAM, with women being the greater

consumers (43%) compared with men (34%) [11]. Those with psychiatric disorders tend to be high users of CAM and this is particularly true for the patients with anxiety. Bystritsky et al. [13] reviewed the evidence of CAM use in populations with anxiety in 2012. The results, consistent with earlier studies, show a 43% use of a variety of CAM treatments in the United States. Users most often had a diagnosis of GAD, were older, more educated and had two or more chronic medical conditions.

The numbers for CAM use for children and adolescents are also significant. A 2012 paper [14] looked at a sample of about 6000 children and adolescents aged 7–17 years, with mental health concerns 29% of whom had used CAM therapy (excluding vitamins and minerals). In contrast, only 12% of those without mental health concerns reported CAM use. CAM use was higher for those with anxiety/depression (34%) than those with ADHD (24%). Children with anxiety alone versus mixed anxiety and depression had similar rates of CAM use (35%). For those with mental health conditions, the most commonly used CAM therapies were mind-body practices (16.3%) and biological therapies (11%), followed by manipulative and body-based therapies (8.5%). Alternative medical systems and energy healing modalities were used by fewer than 3% [14].

These numbers confirm the importance of awareness of CAM use in both adults and children with anxiety and depression. With so many individuals using CAM treatments it is important to consider how these treatments may be interfering with conventional first-line treatments of these disorders. The numbers also highlight the importance of finding the best integrative use for patients who may benefit from other non-traditional treatment modalities, for example, when parents refuse standard medication for their children considering them “too strong” and asking for natural products which they perceive as more safe.

With more patients visiting CAM therapists than primary care physicians, according to one survey [6], it is important to consider the reason for this shift. Among adult patients with mental health concerns, surveys have found that patients choose CAM therapy because of its natural approach and perception of being safe, because CAM treatments align with their own beliefs, because prior experience with conventional medicine had unpleasant side effects or were ineffective and patients wanted to avoid consulting with a health care provider [13]. Moreover, parents are very reluctant to give their children conventional medications thinking that they are potentially addictive and are looking for “natural” treatments that they believe are safer and more effective [1]. In children, CAM use is associated with chronic medical conditions, higher maternal age and education, as well as parental CAM use [15]. As more patients turn to CAM treatments, there is increased awareness: both health professionals and the public are exposed to articles on the subject in professional journals, lay magazines, on the internet (from the comfort of their home) and numerous products are available in various stores.

Conventional medications are more effective in treating anxiety disorders than CAM treatments, but come with increased side effects. In the case of SSRIs, a class of medications commonly used to treat anxiety disorders, some side effects can be perceived as intolerable [16]: the Black Box warnings related to increased suicidal ideation. Effectiveness of conventional treatments is also a concern. Only about 50–65% of patients with anxiety disorders

benefit from antidepressants and CBT [16], and many patients continue to suffer significant symptoms despite treatment, emphasizing the need for further options. For example, conventional approaches may not always be effective for patients with severe OCD, motivating them to try CAM approaches. One other potential reason for the increasing popularity of CAM treatments is a mistrust of the pharmaceutical industry. The perceived blurred boundaries between the pharmaceutical industry and physicians have led to the concern that the industry may have undue influence on a physician's decision to prescribe certain medications [7].

In response to the parents' and physicians' interest in CAM therapies, the United States government is now beginning to become active in promoting the development of CAM. There are several professional associations developed to aid in the funding, support and development of this field. These are the National Institute of Health (NIH), the National Center for Complementary and Alternative Medicine (NCCAM) and Office of Dietary Supplements (ODS). The American Academy of Child and Adolescent Psychiatry (AACAP) has also established its Committee on Integrative Medicine [7].

4. Safety

There is a widespread perception that natural products and remedies are safe, although it is often not the case. Because herbal medicines and other dietary supplements are not regulated as drugs by the Food and Drug Administration (FDA), their manufacturers do not have to prove their safety. One of the most important concerns relates to the fidelity of natural products. Due to the less rigorous efficacy and safety criteria than prescription drugs, herbal remedies and dietary supplements lack standardized preparation, and thus are more prone to contamination and substitution. They are also prone to incorrect packaging and storage, wrong dosage and inappropriate labeling and advertising [1]. Consumers cannot be sure they are taking the amount they are supposed to take or that the product has the all the ingredients listed on its package. The public is not necessarily aware that there is no safety testing of health food store products or oversight of quality control [1]. Therefore, it may be difficult to say that a treatment that worked in one instance is the same treatment that would be offered under the same name elsewhere.

Also, although some CAM therapies have risky side effects, the greatest risk occurs when a person is treated with an unproven CAM therapy instead of a proven conventional medicine approach. Using a CAM therapy as first-line treatment when there is only inconclusive evidence to support it is a significant risk to patient care. Many CAM therapies are clearly safe such as such as meditation or Reiki [17], however many CAM products have potentially significant interactions with other conventional medications. St. John's Wort, for example, has the potential for drug interactions with SSRIs, a standard treatment for anxiety. Its other interactions include "reduced efficacy of birth control pills, antivirals, and many cardiovascular medications" [13]. Kava's potential for liver toxicity has limited its recommendation by practitioners especially for children and adolescents. Furthermore, Kava and Valerian Root can enhance the sedative effect of benzodiazepines [13]. In addition, it may be potentially

difficult to evaluate the effectiveness of a treatment while another treatment is being covertly taken in varying doses.

It is also important for clinicians to know that the adverse effects of CAM treatments tend to be under-reported in many publications in the medical literature as well as in lay media. In many instances, adverse effects are not systematically assessed or might not even be mentioned [7].

The simultaneous use of additional CAM therapies such as relaxation, prayers, meditation and biofeedback that are not part of a patient's CBT treatment could also be potentially problematic. Patients could be given conflicting messages and explanations of their symptoms and how to handle them [13].

5. Effectiveness

The effectiveness of CAM therapies has been difficult to establish and many systematic literature reviews provide inconclusive evidence [7]. Some therapies such as acupuncture have been shown to be effective for specific conditions, but are currently being used more broadly than the specific conditions for which there is evidence. Many forms of CAM have not undergone rigorous scientific evaluation. However, a lack of scientific studies does not mean that a therapy is ineffective. A large number of alternative therapies have been practiced for thousands of years. These include acupuncture, meditation, yoga, therapeutic diets, massage and herbal medicine. However, scientific research on CAM therapies can be difficult due to unique barriers. These include a lack of interest among medical researchers, limited availability of research funds, and difficulties applying conventional research methods to studying alternative therapies [18]. For example, medical researchers often have little scientific interest in acupuncture because its theory depends on non-scientific concepts such as "vital energy". Commercial research funds are limited because CAM therapies cannot be patented and do not generate large profits to drive research and marketing. Government research funds are limited because the scientific community remains skeptical of CAM theory and the validity of its methods [18].

There are several challenges to applying conventional research methods to CAM therapies. Concepts such as standard treatment for each subject in the study, a placebo control group and the method of double blinding are required for a rigorous study. Each of these concepts is difficult to achieve in many CAM treatments [18]. For example, many CAM therapies treat the unique and particular imbalances of an individual. Acupuncture needles are placed at points on the body according to the individual's unique needs. Also, two people with the same condition may be treated with completely different herbal medications.

Double blinding is a process where the subjects as well as the researchers are kept unaware of the difference between the active treatment group versus the placebo control group. This process is designed to eliminate the bias associated with outcome expectations. Placebo designs are used to blind subjects, which are limited in many CAM treatments. Placebo control

groups can be created easily for some CAM treatments such as herbal remedies, but for other practices such as acupuncture and chiropractic treatment it becomes difficult to design a placebo. For therapies such as meditation placebo designs are quite impossible. Researcher blinding may also be limited, for example, a Reiki practitioner would know whether a real energy treatment is being given.

For these abovementioned reasons, it is difficult to draw firm clinical conclusions from much of the research in CAM psychiatry. Among the systematic reviews by the Cochrane Collaboration of CAM treatments throughout pediatrics, “about 70% of the reviews (109 of 163) have been deemed inconclusive, not permitting firm positive or negative conclusions regarding treatment recommendations” [7]. Child and adolescent psychiatrists will nonetheless find a review of these treatments to be clinically useful, because families of patients are often interested in these treatments, and are reluctant to use standard treatments. The use of low-risk, low-cost adjunctive treatments may be defensible even when the level of data supporting their use is not compelling

6. Practical applications

The integration of CAM treatments does not necessarily require clinicians to make major changes in the way they practice. It can be as simple as recommending reliable CAM options to patients who will benefit from a trusted referral to an established CAM therapist. Using some CAM treatments as an adjunct to standard treatment and providing a range of options for patients when they refuse first-line treatments are important first steps. Clinicians should also routinely ask of CAM use in their patient consults. Patients expect disapproval or ignorance from physicians regarding CAM treatments. Parents inform the doctor of their child’s use of CAM in only 12–44% of cases in the United States. In contrast, the disclosure of CAM treatments to pediatricians is 79% in Germany, where CAM is more supported by professional societies, the government and the public [7]. Clinicians can also incorporate CAM research into their clinical practice and teach students and colleagues of how to effectively use CAM therapies. Joining an integrative practice or start a partnership with local CAM specialists where each share care for the patient can also be a good place to start. Individuals can choose to incorporate diverse holistic treatments or start with just natural products and dietary supplements. Prescribers who use these natural products and dietary supplements will want to become familiar with specific brands and products so that they can recommend reliable products that are safe. ConsumerLab.com is a helpful resource for obtaining specific information about different companies and their products, and for following general developments in this area. Many of these products are available at health food stores, but prescribers can inform patients that certain online sources offer brand name products.

Four case studies are described below in which the child psychiatrist utilized complementary and alternative treatments while collaborating with the families of youth. These are followed by literature reviews for vitamin D, melatonin, acupuncture, acupressure and craniosacral therapy.

6.1. Case study 1

Heidi, a 12-year-old girl, had suffered from severe social anxiety disorder with some depressive symptoms for the past 3 years. Her depressive symptoms became worse every fall through the winter months when she had persistent sadness, increased sleep, fatigue, more social withdrawal than before, school non-attendance and lack of enjoyment in activities. She had not been attending school consistently in the past 3 months. Heidi lived with her mother and younger brother. Heidi's mother suffered from generalized anxiety disorder, major depressive disorder and borderline traits while growing up and had "bad side effects" from psychiatric medications.

On assessment, due to Heidi's lack of functioning in all aspects of her life, the child psychiatrist recommended combined treatment of antidepressant and cognitive behaviour therapy (CBT). Heidi's mother refused to start medication and Heidi did not want to do CBT. The psychiatrist checked her baseline labs including thyroid stimulating hormone (TSH) and vitamin D levels. Heidi's TSH was normal; however, her vitamin D levels were very low <25 nmol/mL, a level which signifies deficiency. Heidi was started on vitamin D, 1,000 IU daily. In the meantime, she was monitored at least once a month. She was also placed in a classroom which was small and the setting was conducive to learning for students struggling with anxiety disorders. In this setting, the principles of CBT were embedded in the program. Heidi did fairly well for a few months but when the winter came, she became worse. At this time, the psychiatrist broached the discussion of starting an antidepressant once more. This time the mother relented and agreed. Heidi was started on escitalopram 5 mg daily titrated up to 10 mg daily in conjunction with vitamin D therapy. Heidi had a swift response to medication towards both her anxiety and mood symptoms and was functioning very well after a month of starting treatment. Her vitamin D level was 100 nmol/mL.

Vitamin D is a hormone that can be synthesized by the skin through exposure to sunlight or obtained through certain foods including fish, beef, eggs and fortified foods like milk, orange juice, cheese and cereals. Optimal vitamin D levels are defined as serum 25 OH D levels above 75 nmol/L. Vitamin D insufficiency is defined as levels between 50 and 75 nmol/L and deficiency as levels lower than 50 nmol/L [19]. Vitamin D supplementation, if effective, would provide a safe, less intensive and less expensive alternative to current therapies for anxiety disorders in adolescents. To date, no studies have specifically been done with vitamin D in adolescents with anxiety disorders. Evidence does exist demonstrating the correlation between vitamin D levels and depressive symptomology in a variety of age groups, including adolescents [20,21]. It is important to establish if this is an avenue that can be used as a treatment option by studying the efficacy of correcting the underlying deficiency.

A limited number of studies have been done on vitamin D supplementation and its impact on depressive symptoms. The majority of studies carried out have focused on adult populations with an emphasis on geriatric, obese and female populations [22–29]. Hogberg et al. [30] specifically looked at adolescents and found an increase in plasma vitamin D 25 OH levels after vitamin D supplementation, in addition to a significant decrease in scores on the Mood and Feelings Questionnaire short version, moving the group from an average in the depression range to a sub-threshold value [22]. Unfortunately, the study did not include a control group, which decreases the strength of the findings [22].

A number of studies in adults have also shown improvements in measures of depressive symptoms after vitamin D supplementation [24–26,29,30]. Individuals in these studies were given vitamin D in various dosages, and measures of depressive symptoms were compared before and after treatment. The dosing regimens of vitamin D given between studies varied substantially. Some studies gave one-time treatment [26], some gave annual vitamin D injection [26] and others had daily oral regimens of varied dosages [22–25,28,29]. Treatment length also varied between studies; however, many studies analyzed improvements at the 8-week or 3-month marks. Certain limitations were apparent within the existing literature. The first was a lack of control groups in many of the studies. This warrants the question of whether the effects seen are the result of placebo or whether depressive episodes subsided in the given time frame regardless of treatment efficacy. Another limitation was the small sample sizes used in some of the studies (in one study only nine individuals were studied [29]).

The primary controversy is whether or not vitamin D supplementation is truly an effective treatment for depression. While some studies have shown significance, some have not. Three studies analyzed demonstrated no significant change in measures of depressive symptoms, regardless of increases in serum vitamin D levels [23,27,28]. Of these studies, two used low doses of vitamin D, one utilized annual dosing, and all three looked at postmenopausal female populations without significant vitamin D deficiency [23,27,28]. These methodological differences could account for differences seen.

The existing literature provides compelling reason to believe that vitamin D supplementation for adolescents with known vitamin D deficiency may provide a new manner by which to safely and effectively treat depression. However, the literature is unable to provide strong evidence of treatment efficacy at this point. As a result, further research is required to study the effects of vitamin D supplementation in this specific age group.

6.2. Case study 2

Eric, a 10-year-old male, was brought to child and adolescent psychiatry outpatient clinic by his parents. Eric has had excessive worrying, insomnia, stomachaches and nausea when going to school for the past 6 months. At bedtime, he has anticipatory anxiety about his school day which causes initial insomnia; he takes about 1–2 hours to fall asleep. He had been late to school a few days in the past month due to feeling tired and cranky in the mornings. Eric has a television in his bedroom and watches movies when he cannot sleep. He also has his iPod with him at night. Eric's parents have a difficult time dealing with his anxiety at bedtime. His mother, having an untreated anxiety disorder herself, is prone to enable Eric's worries whereas his father is more firm with him. Eric is functioning well academically and socially and is very engaged in sports.

On assessment, because Eric symptoms had not expanded to other areas of his life i.e. school and with peers and were situated in one domain i.e. home, the psychiatrist recommended sleep hygiene and exclusion of excessive sugar and caffeine from his diet. Regarding sleep hygiene, his parents were advised to have a firm bedtime for Eric, a calming bedtime ritual, i.e. relaxing bath and story time. They were advised to remove the TV and all electronics out of his bedroom. The family tried this for 2 weeks and returned to report that although Eric was calmer with these interventions, he still could not fall asleep. A trial of medication was discussed but parents were not comfortable with starting a psychiatric

medication. The child psychiatrist recommended a trial of Melatonin, over the counter, 3 mg, at night for insomnia and the parents were agreeable. Family returned after 2 weeks and reported Eric was falling asleep within 15 minutes of lying down and was staying asleep for the night. He was waking up in the morning feeling alert and was at school on time.

Insomnia with difficulty either initiating or maintain sleep affects 15–25% of youth [31]. Insomnia is usually a symptom of an anxiety disorder and is usually accompanied with worry, fatigue, irritability and inattention. Having exposure to electronics and screen light before sleeping may contribute to insomnia. Other contributing factors may be use of caffeine and excessive sugar.

Endogenous **melatonin** is important for synchronizing the circadian rhythm; it is a hormone produced by the pineal gland at nighttime. Chronic sleep onset insomnia is present in about 10% of school-aged children; these children have worries, night awakening, difficulty awakening and daytime tiredness [32]. Exogenous melatonin can adjust the circadian rhythm and advance sleep onset [33,34] and may affect chronic insomnia positively.

A 2001 paper [32] studied the efficacy of melatonin in childhood sleep onset insomnia lasting for more than a year. This was a double-blind placebo-controlled trial in 40 elementary school children 6–12 years of age who were randomly assigned to either 5 mg melatonin or placebo for one month. Melatonin treatment was shown to significantly advance sleep onset, reduce sleep latency and increase mean sleep duration in children with chronic sleep onset insomnia. Measures of health status and sleep improved significantly more in the melatonin than in the placebo group. Very few transient side effects were reported [32].

In another study completed in 1999 [35], melatonin was administered to 18 females and 12 males with mean ages of 14.8 years who had insomnia and school phobia. These patients were compared to 27 age-matched healthy controls. Melatonin was administered 1–10 mg daily for a mean of 7.8 months. The dose was adjusted weekly as needed. Sleep disturbances improved mildly to markedly in 25 patients with very few side effects [35].

Although there are a few randomized controlled trials in youth for melatonin, most of them are not in youth with anxiety disorders except the trial in school phobia [35]. However, this study has a very small sample size so results cannot be generalized to a clinical setting. Further research is needed in this population to determine the efficacy of melatonin.

6.3. Case study 3

Sydney is a 15-year-old girl who came to the outpatient mood and anxiety clinic with her mother. Sydney is of mixed Chinese and Caucasian descent, her mother is Caucasian and father is Chinese. Sydney has had increased anxiety in the past year which has affected her in a way such that she feels constantly overwhelmed. She has stress headaches, tension in her shoulders, frequent nausea and insomnia. All medical tests are normal. Sydney was quite irritable due to her feeling of stress and was having frequent crying episodes at the slightest provocation. She was attending school regularly, enjoying her activities and socializing with friends. Sydney had a few recent stressors: a breakup with her boyfriend of 6 months, her pet dog had died after being hit by a car and her parents were having marital discord.

Sydney's mother was a successful naturopath and was averse to any psychiatric medication. Her father was also in favour of Eastern medicine; Sydney did not want to pursue CBT. The child psychiatrist informed them of the treatments that could be offered and when encountering resistance and refusal, engaged Sydney and her mother and then her father over the phone in a discussion of their preference for complementary and alternative treatments. Parents and Sydney agreed on doing acupuncture for her symptoms. The child psychiatrist got in touch with Sydney's acupuncturist for continued collaboration and ongoing monitoring.

Acupuncture involves inserting extremely thin needles through skin at strategic points on the body. Acupuncture is a key component of traditional Chinese medicine and is most commonly used to treat pain. Acupuncture, in traditional Chinese medicine, is a technique for balancing the flow of energy or life force known as "qi" or "chi" believed to flow through pathways (meridians) in the body. Needles are inserted into specific points along these meridians such that energy flow will re-balance.

Anxiety disorders are often associated with symptoms that are treated with acupuncture, i.e. pain, nausea and depression. Currently, there are no randomized controlled trials for acupuncture in children and adolescents in anxiety disorders. Liu et al. [36] randomized 240 adult patients with anxiety neurosis to either acupuncture, behavioural de-sensitizations and combined treatment of acupuncture and behavioural desensitization. Treatment was provided over range of 1–10 sessions with standard being 4 sessions. Behavioural desensitization was provided over 2 sessions per week. The combined treatment group had a significantly greater improvement after 10 sessions; however, all groups experienced improvement.

A second randomized controlled study [37] enrolled adult patients with minor depression or generalized anxiety disorder. Randomization was done to receiving either body acupuncture at 5 points or sham acupuncture for 10 sessions. The acupuncture group had a significant improvement over the sham group over 10 sessions; however, no improvement was seen over 5 sessions.

Two studies done in China compared antidepressants with acupuncture in adult patients. Chao-Ying et al. [38] compared acupuncture for 45 minutes for 6 weeks to an antidepressant trazodone. No differences in treatment were seen possibly due to the short duration of the study.

Zheng, Zeng and Deng [39] studied a larger adult sample of 296 patients with anxiety disorders and compared them to acupuncture and the antidepressant doxepin over 5 weeks. Patients received a total of 30 sessions of acupuncture. Although there were no differences between the two groups, there were minimal improvements in both groups.

Acupressure is a non-invasive and safer form of treatment than acupuncture. It involves using parts of the body, i.e. fingers, thumbs, palms, elbows and heels of the hand, to apply pressure to stimulate specific points along energy channels or "meridians". Carotenuto et al. [40] studied 25 adolescents with insomnia and used acupressure using an elastic wristband which applied continuous pressure at points to eliminate insomnia. The study duration was 6 months and polysomnography was used for assessment of sleep alterations. Subjects showed an increase in sleep quality and efficiency at the end of the study.

Effects of acupressure on the levels of physical and emotional stress were studied by Dads et al. (2011) in 47 adolescents in high school in the treatment group and 48 in the control group. The students self-applied acupressure for 15 days for 5 minute sessions each day. There was a significant decrease in the levels of stress of these students at the end of the study. This study signifies the importance of this safe, cost-effective and non-invasive treatment for stress or anxiety in youth. However, none of the trials of acupuncture or acupressure are in youth with anxiety disorders.

6.4. Case study 4

Dan, an 8-year-old boy, was referred to the outpatient clinic after his anxiety symptoms had become worse resulting in anger outbursts. He was experiencing obsessions and compulsions about germs and contamination and was avoiding touching things. He was also having difficulty with sleep due to grinding his teeth at night. Dan and his family had experienced an automobile accident in which Dan had suffered severe whiplash. He did not have any flashbacks or nightmares and was not avoidant in his daily functioning.

Parents were looking to help Dan, but were not ready to consider any psychiatric medications; they did not have time to come in for the parent anxiety CBT groups that the clinic offered. Dan's mother, who also had injuries during the accident, had been successfully treated with craniosacral therapy. She had a lot of trust in her craniosacral practitioner and decided to consult her for her son's treatment.

Craniosacral therapy (CST) involves the craniosacral system starting from the skull, face, mouth and the spine down to the sacrum and coccyx. It is described as "a gentle, hands on approach that releases tensions deep in the body to relieve pain and dysfunction and improve whole-body health and performance" [41]. Practitioners of craniosacral therapy "release restrictions in the soft tissues that surround the central nervous system" by using gentle touch [41]. CST is used for headaches, chronic neck and back pain, stress and tension-related disorders, temporomandibular joint syndrome, attention-deficit hyperactivity disorder, post-traumatic stress disorder [41]. No CST studies have been done on youth or adults with anxiety disorders. There are a few randomized controlled trials.

Mann and authors [42] recruited 69 adult outpatients with migraines and randomized them to CST or sham treatment of 8 weekly sessions. Headache intensity was reduced in CST patients, but the difference was not statistically significant.

A recent study [43] conducted a randomized controlled trial in 50 adult patients with chronic non-specific neck pain. Patients were randomly assigned to CST or sham treatment for 8 weeks and assessments were done for the credibility of the sham treatment. There were no differences between the groups in symptom improvement; however, patients were convinced about the credibility of the sham treatment.

A study in 2011 [44] looked at 84 adult patients with fibromyalgia and the effects of CST on depression, anxiety and quality of life. Patients were randomly assigned to either CST or placebo or sham group for 25 weeks. Patients in the CST showed significant improvement in overall anxiety measures, quality of life and sleep quality. One year later, there were no

differences between the groups in anxiety, depression and quality of life, but there was still improved sleep quality index in the CST group.

In summary, although there is overall inconclusive evidence on efficacy and safety on many CAM treatments, there are enough data in some specific treatments to be used safely and judiciously in conjunction with Western psychiatric treatment. One third of patients are already using complementary and alternative treatments. Regardless of the methodological problems of these studies, it is essential that practitioners look beyond the Western treatments as these are often more appropriate for moderate to severe symptoms. For patients having mild to moderate symptoms of an anxiety disorder, CAM treatments can be utilized if the family is unwilling to try conventional treatment and is already convinced that CAM treatments may be more appropriate.

Author details

Sarosh Khalid-Khan^{1*}, Faiza Khalid-Khan² and David Gratzer²

*Address all correspondence to: khalids@hdh.kari.net

1 Hotel Dieu Hospital affiliated with Queen's University, Kingston, ON, Canada

2 The Scarborough Hospital, Birchmount campus, affiliated with University of Toronto, Scarborough, ON, Canada

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