A Systematic Review: Effectiveness of Complementary Therapies on Mental Status of Pediatric Oncology Patients

Sara Fredricks
ses179@zips.uakron.edu

Jessica Lloyd
jbl25@zips.uakron.edu

Whitney Wendling
waw27@zips.uakron.edu

Follow this and additional works at: https://ideaexchange.uakron.edu/honors_research_projects

Part of the Alternative and Complementary Medicine Commons, Animal-Assisted Therapy Commons, Art Therapy Commons, Other Mental and Social Health Commons, and the Pediatric Nursing Commons

Please take a moment to share how this work helps you through this survey. Your feedback will be important as we plan further development of our repository.

Recommended Citation
Fredricks, Sara; Lloyd, Jessica; and Wendling, Whitney, "A Systematic Review: Effectiveness of Complementary Therapies on Mental Status of Pediatric Oncology Patients" (2020). Williams Honors College, Honors Research Projects. 1235.
https://ideaexchange.uakron.edu/honors_research_projects/1235

This Dissertation/Thesis is brought to you for free and open access by The Dr. Gary B. and Pamela S. Williams Honors College at IdeaExchange@UAkron, the institutional repository of The University of Akron in Akron, Ohio, USA. It has been accepted for inclusion in Williams Honors College, Honors Research Projects by an authorized administrator of IdeaExchange@UAkron. For more information, please contact mjon@uakron.edu, uapress@uakron.edu.
A Systematic Review: Effectiveness of Complementary Therapies on Mental Status of Pediatric Oncology Patients

Sara Fredricks, Jessica Lloyd, & Whitney Wendling

The University of Akron

Author’s Note

Sara Fredricks, Jessica Lloyd, and Whitney Wendling, School of Nursing, The University of Akron. This paper is in fulfillment of the Williams Honors College.
Abstract

Children with cancer frequently suffer from depression, anxiety, feelings of hopelessness, and psychological stresses related to knowledge of potential risks, associated treatments, and the illness itself. These psychological problems can cause many additional physiological problems for these already chronically ill patients and may be detrimental to their overall health. The purpose of this systematic review is to review and critically appraise the evidence to determine if the use of Complementary and Alternative Methods (CAM), along with standardized care, affects mental health outcomes in pediatric cancer patients. Twenty-one primary source publications between 2013 and 2019 were analyzed for this systematic review. Within the pediatric oncology population, up to 84% are using some form of complementary and alternative therapies as an adjunct to standard medical treatment. Complementary and Alternative Methods have been found to decrease levels of stress, depression, and anxiety (Sanchez, Karlson, Hsu, Ostrenga, and Gordon 2015). These therapies also have been found to increase oxygenation saturation as well as decrease pain and irritation (Uglow, 2019).
Chronic illnesses are becoming more relevant issues in society today, as ten to twenty million children and adolescents in the United States suffer from chronic diseases or disabilities (American Academy of Pediatrics, 2019). Chronic illness is generally defined as any disease that persists for an extended period of time, and an example of this type of illness is cancer. According to the American Childhood Cancer Organization (2020), it is estimated that in America 15,780 children aged 0-19 are diagnosed with cancer each year; furthermore, 300,000 children worldwide are diagnosed with cancer each year and cancer remains the number one cause of death by disease for children in the United States. Furthermore, the percentage of children reported to have incidences of cancer has increased 0.8 % per year from 2010 to 2014, with some of the most common kinds of cancers found in these children being leukemia, brain tumors, non-Hodgkin’s lymphoma, soft-tissue, Hodgkin’s lymphoma, and bone and joint (American Childhood Cancer Organization, 2020). Pediatric patients with chronic illnesses, such as cancer, undergo numerous treatments that increase psychological distress, depression, and anxiety which can lead to a poor quality of life and poor mental health (McCullough et al., 2018).

The prevalence of mental health problems, such as depression, has been identified throughout the care of chronically ill pediatric patients. Researchers who have measured depression in this population with the Children’s Depression Inventory (CDI), finding that 80% of medically ill children experience depression (Mavrides & Pao, 2014). This is a significant problem because psychological distress, depression, and anxiety can manifest as physiological symptoms such as increased blood pressure, pulse, and respiratory rate. These symptoms may be experienced by the client as feelings of nausea, pain, and fatigue which may adversely affect
physical well-being and possibly impede chronic illness treatment and recovery (McCullough et al., 2018).

Additionally, anxiety is one of the most common symptoms seen in children going through cancer treatment (Mavrides & Pao, 2014). According to Shaw and DeMaso (2010), 59% of pediatric oncology patients have a diagnosable mental health issue as a result of treatment; furthermore, 15% of oncology kids are diagnosed with anxiety and 10% are diagnosed with depression. Mental health is a vital component of a client’s overall health about which the professional nurse should be concerned because one of the main ethical considerations of nursing is beneficence, which stands for only doing good for one’s patient. Further, the aim of evidence-based practice is best patient outcomes. Several researchers have tested theories and interventions based on hypotheses and evidence that Complementary and Alternative Methods (CAM) may be beneficial to one’s quality of life (Li et al., 2018; McCullough et al., 2018; Psihogios, Ennis, & Seely, 2019).

According to a study done by Sanchez, Karlson, Hsu, Ostrenga, and Gordon (2015), the main reasons for using CAM in pediatric oncology patients are to provide hope, improve quality of life, and lessen the adverse effects of cancer and oncology treatments. These are outcomes that standard and pharmacological interventions may not be able to improve due to the pharmacological ineffectiveness, side effects, drug-drug interactions, and adverse effects of chemotherapy medications on the body. The purpose of this systematic review is to review and critically appraise the evidence to determine the effect of complementary therapies, along with standardized care, on mental health outcomes in pediatric cancer patients. Therefore, the PICO format question at hand is: In pediatric oncology patients, how do complementary and alternative
COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

therapies paired with standardized care, compared to the sole use of standardized care, affect mental health outcomes?

**Methods**

Data were collected for this review by searching through several different databases. These databases included CINAHL Plus with Full Text, Health and Psychosocial Instruments, Health Source: Nursing/Academic Edition, MedicLatina, MEDLINE with Full Text, Psychology and Behavioral Sciences Collection, PsycINFO. The key words utilized in the search were Pediatric oncology, pediatric cancer, complementary therapies, alternative therapies, psychological distress, mental health, and quality of life. Each retrieved study had to meet the inclusion criteria of: a primary source that was published within the last six years (2013-2019), focused on the population of pediatric cancer patients, and an intervention of complementary therapies. Furthermore, the setting of these research studies was extended to include international trials, as ten studies took place in the United States (North America), another originated in the Asia-Pacific of Honolulu, Hawaii, one trial was focused on a population in both Canada and the U.S., and the remaining nine took place in various other regions including Germany, China, Canada, Iran, Australia, England, areas in South America. Some of the exclusion criteria included a population who had other chronic illnesses other than cancer and those who are 18 and older. When choosing articles to include in the review, there were certain criteria that needed to be met. Selection of studies was based upon their research approach and methods for testing rather than the results of the studies in order to avoid selection bias. See Appendix A for a PRISMA chart describing the search and selection process, and see Appendix B for the Table of Evidence.

**Review of Literature**
Of the twenty-one studies in this review, quantitative designs included: experimental, exploratory, non-experimental, quasi-experimental, randomized control trial and randomized prospective study. Levels of evidence generated by studies ranged from 4 to 5. Data collection methods included cross-sectional, prospective, and longitudinal. Settings of the studies varied from regular outpatient oncology visits at hospitals (McCullough, 2018) to a rehabilitation clinic in Katharinenhöhe, Germany (Gottschling et al., 2013). Nursing specialties included in the studies included: pediatric, oncology, acute care, ICU, and home health. Many of the studies utilized convenience sampling (Celebioglu, Gurol, Yildirim, & Buyukavc, 2014; Li et al., 2018; Gottschling et al., 2013; Karlik & Ladas, 2014; Tucquet & Leung, 2014; Uglow, 2019; Valji et al., 2013; Zucchetti et al., 2018). The sample size ranged from 9 (Zucchetti et al., 2018) to 457 (Gottschling et al. 2013). Measures across studies included the percentage of the population that uses CAM, most used types of CAM, and levels of stress, pain, depression, and anxiety before and after therapies were implemented. These variables were measured with surveys given before and after CAM interventions, assessment of vital signs and biomarkers, for example, findings of decreased blood pressure (Jalalodini, A., Nourian, M., Saatchi, K., Kavousi, A., & Ghaljeh, M., 2016) and increased oxygen saturation levels (Uglow, 2019). Independent variables included interventions of animal therapy; art and music therapy; health, exercise, and wellness; massage; and others, such as spirituality, Reiki, and naturopathy. The effects of these intervention categories are described below.

**Animal Therapy**

Animal therapy has been examined as an intervention on outcomes in pediatric oncology patients. Consistent evidence was found about the effects of animal-assisted therapy on stress and anxiety levels in these patients. For example, McCullough et al. (2018) examined the effects
COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

of animal-assisted therapy on stress, anxiety, and quality of life of 106 pediatric oncology patients and found that the intervention group of 60 participants showed significantly decreased stress and anxiety levels and increased quality of life. Their findings were in line with those of Silva and Osorio (2018), who found significant improvements respectively in pain (d=−0.894), irritation (d=−0.917), and stress (d=−1.404) levels in pediatric oncology patients using Cohen’s d, as well as decreases of depressive symptoms (d=−0.801). Finally, Uglow (2019) found that use of animal-assisted intervention resulted in decreased depression, increased oxygen saturation levels, and decreased anxiety in 118 hospitalized children with cancer, compared with children who did not receive this intervention.

Art and Music Therapy

Researchers have studied the effects of art and music therapy on outcomes in pediatric oncology patients and their families, and findings are inconsistent. In a sample of 38 pediatric oncology patients and their families, Tucquet and Leung (2014) found that music therapy decreased depression and anxiety, produced a sense of calmness, and assisted in helping pediatric oncology patients cope during treatments and procedures that tend to cause distress. The researchers also found that the participating families regarded music therapy as a valuable tool (Tucquet et al., 2014). The effects of art therapy has also been studied by researchers who found that pediatric patients reported decreased anxiety through active engagement with their imagination; by giving patients the opportunity to draw out their feelings, they were able to work through them in a therapeutic space (Woodgate, West, & Tailor, 2014).

Exercise, Health, and Wellness

Exercise interventions in pediatric oncology patients have included dance, yoga, and forms of physical activity, and each was found to have significant effects on decreased stress,
pain, and anxiety (Ho, Fong, Cheung, Yip, & Luk, 2016; Li et al., 2018; Stein et al., 2019).

Furthermore, Ho and colleagues (2016) found that while symptoms of cancer have been found to lead to a poorer quality of life, dance movement therapy (DMT) can have positive effects by enabling pediatric oncology patients to cope with their feelings of depression and fear and share their emotions with others who are going through a similar experience. Karlik et al. (2014) found that yoga/movement therapies are among the most common CAM therapies through a survey given to oncology patients in which 30.8% stated they used yoga/movement therapies as a form of CAM. Although Stein et al. (2019) found positive outcomes for yoga therapies, including improved management of stress and anxiety, the findings are limited by a small sample of 10 participants. Adventure-based training exercise interventions have also been found to improve self-efficacy in childhood cancer survivors, which is a strong indicator of increased quality of life that the cancer survivors will maintain regular physical activity (Li et al., 2018).

**Massage Therapy**

Massage therapy has been utilized in various cultures around the world as a therapy to aid in reducing stress, pain, and anxiety (Celebioglu et al., 2014). Celebioglu et al. (2014) further described that cancer treatments are extremely stressful and reduce quality of life in pediatric oncology patients and their families; the researchers found that 27.8% of pediatric oncology patients turned to massage as an additional supportive intervention to relieve symptoms of anxiety, stress, and pain. Many studies have been performed on adults regarding the intervention of massage therapy, but fewer studies focusing on children and adolescents have been performed. However, among those studies, consistent findings have shown that massage therapy is effective in reducing anxiety in children (Jalalodini, Nourian, Saatchi, Kavousi, & Ghaljeh, 2016).
Other Types of CAM

Spirituality has also been identified as an intervention to aid in improving the mental health of pediatric oncology patients. Ghiasuddin, Wong, and Siu (2015) looked at the effects of healing touch on pain, distress, and fatigue and found that pediatric oncology patients from a variety of ethnic backgrounds were more accepting of healing touch. Several patients had attitudes/beliefs surrounding this type of intervention, leading to the conclusion that knowledge of different cultures may inform interventions that then are more likely to improve patient care. Zucchetti et al. (2016) looked at Reiki, which is an emerging complementary therapy in pediatric cancer patients and found that decreased pain occurred in the experimental period while the follow-up investigation of pain remained stable. Researchers have also studied the effects of naturopathy in pediatric oncology patients.

Naturopathy is an alternative medicine focused on natural remedies of healing the body or treating symptoms (Psihogios et al., 2019). Naturopathy can include a wide variety of treatments, including natural health products (NHPs) and nutrition. These were studied by Psihogios and colleagues (2019) who found that NHPs and nutrition, in conjunction with conventional oncology care, improved quality of life and decreased side effects of cancer treatments in pediatric oncology patients; use of vitamin D, zinc, and vitamin B had the largest effects on quality of life with 17.8%, 12.0%, and 39.1% increase respectively.

Limitations

Although the studies were reviewed in depth and detail, many have limitations. Of the 21 studies that were reviewed, nine studies were limited by sample size including Adams, Spelliscy & Sivakumar (2013), Ghiasuddin, Wong & Siu (2015), Stein et al. (2019), Sheri et al. (2017), and Zucchetti et al. (2018). Another limitation was that some studies did not have a control group
to compare to the experimental group. These studies included: Jalalodini et al. (2016), McCullough et al. (2018), Sanchez, Karlson, Hsu, Ostrenga, & Gordon (2015), and Silva & Osorio (2018). Several studies lacked cultural diversity, limiting participants to one or two cultures including Gottschling et al. (2013), Woodgate et al. (2014), and Valji et al. (2013).

Critical Appraisal of Evidence

Limitations

Of the studies in this review, designs included: cross-sectional, experimental, exploratory design, non-experimental, quantitative, quasi-experimental, randomized control trial and randomized prospective study. Settings of the studies varied from regular outpatient oncology visits at hospitals (McCullough et al., 2018) to a rehabilitation clinic in Katharinenhöhe, Germany (Gottschling et al., 2013). Nurses who were included in the studies included: pediatric, oncology, acute care, intensive care unit (ICU), and home health. Many of the studies utilized convenience sampling including Karlik and Ladas (2014), Gottschling et al. (2013), Tucquet and Leung (2014), Li et al. (2018), Zucchetti et al. (2018), Celebioglu et al. (2014), Uglow (2019), and Valji (2013). The sample size ranged from 9 patients (Zucchetti et al., 2018) to 457 (Gottschling et al. 2013).

Although the studies were reviewed in depth and detail, many have limitations. Of the 20 studies that were reviewed, nine studies were limited by sample size. This could have caused the results to be an unreliable indicator of the whole pediatric population. Some of the studies with small sample sizes were Zucchetti (2018), Stein et al. (2019), Sheri et al. (2017), Adams, Spelliscy & Sivakumar (2013), and Ghiasuddin et al. (2015). Another limitation was that some studies did not have a control group to compare to the experimental group, instead these journals were quasi-experimental studies. These studies included: Jalalodini et al. (2016), McCullough et
COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

al. (2018), Sanchez et al. (2015), and Silva & Osorio (2018). There were three studies, Gottschling et al. (2013), Valji et al. (2013), and Woodgate et al. (2014), that lacked cultural diversity, limiting participants to one or two cultures.

Validity and Reliability

Different instruments were used throughout the studies. Most studies were nonexperimental surveys given via hard copy or electronically. Nonexperimental designs are considered reliable and a valid source of evidence since they describe the phenomenon in detail and have a lower level of bias because the independent variable is not manipulated by the researcher. Weaknesses of nonexperimental designs include researchers not being able to make claims about the cause and effect because the independent variable is not manipulated. Several studies including Ho et al. (2016), McCullough et al. (2018), and Jalalodini et al. (2016) were randomized control trials are considered reliable and a valid source of evidence since there are strict guidelines for including subjects in a study and the subjects are randomly assigned to either the intervention or control group. Weaknesses of randomized control trials include potential bias because the researcher manipulates the independent variable. Zucchetti et al. (2019), Uglow (2019), and Valji et al. (2013) used cross-sectional studies which are considered to be reliable and a valid source of evidence because they are not limited to a single exposure and disease, but can examine multiple simultaneously. Weaknesses of cross-sectional studies include temporal ambiguity and lack of ability to distinguish determinants of cause. A quasi-experimental design was used by Woodgate et al. (2014), Silva and Osorio (2018), and Celebioglu et al. (2014) which serve an important function in providing beginning evidence of causality but lack randomization or a control group (Schmidt & Brown 2019). Stein et al. (2019) used an exploratory design which is used when little is known about the phenomenon, so it requires exploration.
COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

Synthesis of Evidence

Through research of numerous studies many beneficial outcomes were identified using several different types of CAM in the current state of evidence. The most common types of CAM found in the research for pediatric oncology patients included animal therapy, art and music therapy, exercise, health, and wellness, massage therapy, spirituality, and naturopathy. The studies included in this systematic review provided prime examples of how these therapies positively affect the mental and physical health of pediatric patients. A small number of studies suggested little to no difference between the use of CAM with pediatric patients; however, the prevalence of these studies remains was found to be much less than those promoting the utilization of CAM therapies, and all of the positive health outcomes they entail.

First, researchers found that the use of animal therapy on pediatric cancer patients decreased depression and anxiety, increased oxygen saturation levels, and had significant improvements in pain, irritation, and stress levels (McCullough et al., 2018; Silva & Osorio 2018; Uglow et al., 2019). Furthermore, improvements were found portraying a significant decrease in pain, irritation, and stress levels on patients as well as a decrease of depressive symptoms such as anxiety, loss of appetite, and mood changes (Silva & Osorio, 2018). Strengths of these studies included large sample sizes and significant findings contributing to the mental health of pediatric cancer patients. Based on the critical appraisals of these studies, findings were similar suggesting a strong reliability in the outcomes portrayed in the studies.

Second, researchers found that the use of art and music therapy on pediatric cancer patients promoted a sense of calmness, increased ability to cope, and decreased depression, anxiety, and emotional distress (Tucquet et al., 2014; Woodgate et al., 2014). This type of
COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

therapy engages pediatric patients in a unique way that allows them to express their emotions and overall mental health through creativity (Woodgate et al., 2014).

Third, exercise, health and wellness, and massage therapy have shown to decrease levels of stress and anxiety, as well as reduce pain (Celebioglu et al., 2014; Ho et al., 2016; Jalalodini et al., 2016; Li et al., 2018; Stein et al., 2019). The study from Li et al. (2018), explains that including regular exercise in one’s health regimen is vital when it comes to maintaining self-efficacy, as the loss of one’s independence can be a major contributing factor in an oncology patient’s stress. The effects of the physical activities of dance, yoga, and other movement therapies were studied on oncology and pediatric oncology patients, and evidence showed positive outcomes regarding stress and anxiety levels (Karlik et al., 2014; Stein et al., 2019). Additionally, the utilization of physical massage has shown to be a beneficial intervention to relieve stress, and anxiety, and pain in pediatric oncology patients (Celebioglu et al., 2014, Jalalodini et al., 2016). Although the sample sizes for these studies are small, the evidence from the numerous studies is consistent in showing that these physical interventions are advantageous for the mental wellness of pediatric oncology patients.

Lastly, spirituality and naturopathy have both been identified as interventions to aid in improving mental health of pediatric oncology patients. When looking at spirituality, Ghiasuddin et al. (2015), looked at the effects of healing touch on pain, distress and fatigue. It was found that the cultures that were accepting of spirituality had better patient outcomes and better patient care. Another type of spirituality that was looked at was Reiki. Zucchetti et al. (2016) looked at this therapy and concluded that a decrease in pain occurred during the experimental period and when they followed up with the pediatric oncology patients afterwards their pain remained stable. Then naturopathy was also observed in these pediatric patients, which is a variety of treatments that
include natural health products and nutrition. Psihogios et al. (2019) concluded that naturopathy improved quality of life in pediatric oncology patients and it also decreased the side effects of the chemotherapy and other cancer therapies. It was also found that the use of vitamin D, zinc and vitamin B had the largest effects on improving quality of life in these patients.

Overall, CAM therapies, when paired with standardized care, have higher positive outcomes compared to the sole use of standardized care in pediatric oncology patients. The results in this study discussed the overwhelming evidence of effective outcomes for pediatric patients with chronic illnesses, mainly cancer, when different methods of CAM therapies were incorporated into standard care. This information can assist health care providers in understanding the importance of the use of CAM therapies on pediatric oncology patients and the reasons to promote these types of therapies. The overall outcome of the research provides critical evidence as to why CAM therapies should be considered as part of standard care for pediatric patients with chronic illnesses to improve mental health outcomes.

**Recommendations**

Due to the great amount of research supporting the positive effects of complementary therapies in pediatric oncology patients, it can be stated that complementary therapies should be used and promoted in the clinical setting for these patients. Nurses can promote complementary therapies in the clinical setting by providing education on the positive effects that these therapies have. Nurses can do this by giving examples and showing visual aids to help parents better understand what these therapies are and how they will work.

While performing this systematic review, it is recognized that more research could be done on this subject. Much research has been done on the immediate effects of CAM therapies on pediatrics patients; however, there is a gap in the literature regarding a more extensive
COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

timeline, age differences, and the prevalence of types of CAM therapies available to these patients. This gap in the literature could be due to the lack of studies that conduct long term outcomes of CAM therapies. Moving forward, further research should be directed towards these gaps in the literature to determine the long term effectiveness of CAM therapies on pediatric cancer patients of varying ages.
COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

References


https://doi.org/10.1371/journal.pmed.1000100


COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY


Appendix A

PRISMA 2009 Flow Diagram

Records identified through database searching (duplicates removed automatically) (n = 502)

Additional records identified through other sources (n = 0)

Records screened for relevance: (n=159)

Records excluded (n =122)

Full-text articles assessed for eligibility (n = 37)

Full-text articles excluded based on inclusion/exclusion criteria

Studies included in review

### Systematic Review Table of Evidence

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Shoshani, A., &amp; Kanat-Maymon, Y. (2018). Involvement in care in pediatric cancer patients: Implications for treatment compliance, mental health and health-related quality of life. Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care &amp; Rehabilitation, 27(2), 567–575. <a href="https://doi.org/ezproxy.uakron.edu:2443/10.1007/s11360-017-1744-9">https://doi.org/ezproxy.uakron.edu:2443/10.1007/s11360-017-1744-9</a></td>
<td>Purpose statement: Determine the mental health consequences that certain treatments have on children with cancer. Research question: Does a child’s compliance with treatments cause less mental health issues and more positive attitudes in the client?</td>
<td>Setting: Hospital Sampling method: Split Sample Sample size: 236</td>
<td>Design: Non-Experimental; Quantitative Level of Evidence: 5</td>
<td>Involvement in care does have a positive correlation to treatment compliance. Additionally, there were more positive relationships and emotions developed in these patients.</td>
<td>This study implicates that the involvement of a child, regardless of age, in the decisions and explanations of their care should be utilized in order to have more positive health outcomes for these pediatric cancer patients.</td>
<td>The amount of information and involvement that the child had was measured, but the actual quality of the information was not measured. The cross-sectional design only allows the patient’s involvement during the time being, whereas a longitudinal study may be able to more accurately measure if the client’s positive attitude continues throughout further treatments. Only measures from the child’s point of view of survey, whereas measuring this study from the child, parent, and doctor’s point of view may give more accurate information.</td>
</tr>
<tr>
<td>2 Karlik, J. B., Ladas, E. J., Ndao, D. H., Cheng, B., Bao, Y., &amp; Kelly, K. M. (2014). Associations between healthy lifestyle behaviors and complementary and alternative medicine use: integrated wellness.</td>
<td>Purpose Statement: To compare CAM and other lifestyle therapies in children who are cancer survivors.</td>
<td>Setting: Medical Center Sampling Method:</td>
<td>Design: Non-experimental Level of Evidence: 5</td>
<td>There is a strong association between CAM use and lifestyle therapies with an increased general wellness in life.</td>
<td>This study suggests that the use of CAM in nursing practice will most often result in an improved general wellness of the patient, as well as promote</td>
<td>Some of the limitations in this study included recall of clients and selection bias in the sample.</td>
</tr>
<tr>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Research Question:** Does the use of CAM promote a healthier lifestyle for those who are childhood cancer survivors? | **Convenience sample**<br>**Sample Size:** 197 | **Purpose Statement:** Identify therapeutic therapies that are recommended by ND’s, and identify reasons for their use and how they affect pediatric oncology patients. | **Setting:** ND’s in Oncology Association of Naturopathic Physicians<br>**Sampling Method:** Voluntary Response<br>**Sample Size:** 99 | **Design: Non-experimental**<br>**Level of Evidence: 5** | **Results show that about half of ND’s use complementary and alternative methods to relieve symptoms of pediatric oncology, whereas the other half believes that there should be more research performed before they use it.**  
From those who do recommend it, five of the most frequently suggested natural health products (NHP) include fish-derived omega-3 fatty acid (83.3%), vitamin D (83.3%), probiotics (82.1%), melatonin (73.8%), and vitamin C (72.6%). Five of the most utilized nutritional diets include anti-inflammatory diets (77.9%), dairy restriction (66.2%), Mediterranean diet (66.2%), gluten restriction (61.8%), and ketogenic diet (57.4%). The five most common physical interventions are exercise (94.1%), acupuncture (77.9%), acupressure (70.3%). | **This study implicates that more research should be performed in order to better understand the efficacy and safety of utilizing CAM for pediatric cancer treatment.** | **Some of the limitations to this study include small sample size, as well as limited research.** |
| 4 Gottschling S, Meyer S, Längler A, et al. Differences in use of complementary and alternative medicine between children and adolescents with cancer in Germany: A population-based survey. Pediatr Blood Cancer. 2014;61:488–492 | Purpose Statement: To examine the use of CAM in both children and adolescents with cancer in Germany. Research question: Is there a difference in the prevalence and reasons for the use of CAM in children and adolescents? Setting: Rehabilitation clinic Katharinenhöhe, Germany Sample Method: Children within the clinic split into subgroups based on age (child or adolescent) Sample Size: 457 Design: Non-experimental Level of Evidence: 5 | There is no significant difference in the reasoning or prevalence of the use of CAM between children and adolescents with malignant cancer. This study implicates that the main reason for a client not to use CAM is a lack of proper education, and this article suggests that physicians and patients would profit from the use of CAM if it was more rigorously studied and better understood concerning its safety and effectiveness. One of the limitations of this study was that it focused solely on participants in Germany, therefore there will be more culturally based information and harder to compare to other studies. |

<p>| 5 Ho, R. T., Fong, T. C., Cheung, I. K., Yip, P. S., and Luk, M. Y. (2016a). Effects of a short-term dance movement therapy program on symptoms and stress in patients with cancer. | Purpose Statement: Examine the effectiveness of dance-movement therapy (DMT) on symptoms related to cancer treatment. Setting: Two Public Hospitals and three Community Design: Experimental; Randomized Control Trial Results showed that dance-movement therapy does decrease symptoms of stress, pain severity, and pain interference in | This study implicated that utilizing DMT in the hospital setting would help to reduce anticipated stress and pin from the disease. Some limitations of this study include, this study was only built to measure the effect on patients who were ambulatory, so patients... |</p>
<table>
<thead>
<tr>
<th>Research Question: Does dance movement therapy improve cancer patients’ overall quality of life by reducing stress, anxiety, depression, fatigue, pain, and sleep disturbance?</th>
<th>Centers in Hong-Kong China</th>
<th>Level of Evidence: 5</th>
<th>clients with breast cancer. and treatments of cancer patients. Additionally, this study eludes that future research should focus in on the optimal dosage and duration of DMT with patients.</th>
<th>who are less mobile were not represented in this study. Next, there may be sampling bias because who are too fatigued may not be able to perform in the activity. Additionally, there was a time constraint for the intervention, as a result of the limited duration of radiotherapy that may have impacted the observed outcomes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose Statement: Gain a more in depth understanding of internal conflicts experienced by cancer patients. Research Question: Does the use of electronic drawing increase therapeutic treatment and quality of life for children with cancer?</td>
<td>Setting: Hospital in Canada</td>
<td>Design: Quasi-experimental</td>
<td>Results showed that the electronic drawing tool was very useful in aiding pediatric cancer patients to express their existential challenges.</td>
<td>This study showed that utilizing electronic drawing in practice may have notable therapeutic effects for pediatric cancer patients in regard to managing suffering and anxieties related to the disease and treatment.</td>
</tr>
<tr>
<td>Purpose Statement: Measure the effects of animal-assisted intervention on stress, anxiety, and quality of life of pediatric oncology patients and their parents. Research Question: Does the use of animal-assisted intervention have an effect on the quality of life of pediatric oncology patients?</td>
<td>Setting: Regular outpatient oncology visit at the University of Mississippi Medical Center</td>
<td>Design: Experimental; Randomized Control</td>
<td>Parents in the intervention group showed significantly decreased parenting stress. However, there were no significant differences observed in the intervention group and control group over time.</td>
<td>This trial implicates that the use of animal-assisted interventions may be beneficial in the care of pediatric cancer patients, as participants reported many positive reasons for using CAM, including to gain hope, improve quality of life, and control pain</td>
</tr>
<tr>
<td>Setting: Hospital in Canada</td>
<td>Design: Experimental; Randomized Control</td>
<td>Level of Evidence: 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References:
Purpose Statement: To examine the prevalence and modalities of complementary and alternative medicine (CAM) use in children with cancer

Research Question: What are the reasons for use of CAM; and the use of CAM before, during, and after treatment in children with cancer?

Setting: Regular outpatient oncology visit at the University of Mississippi Medical Center

Sampling Method: Eligible participants were selected by medical staff during daily chart review

Sample size: 101

Design: Non-experimental

Level of Evidence: 5

Participants reported many positive reasons for using CAM, including to gain hope, improve quality of life, and control pain. Thus, CAM use appears to be an important aspect of medical care for many pediatric oncology families and should be a consideration when providers are discussing treatment and quality of care with families.

This study shows that the use of CAM can help to improve the quality of care given to pediatric oncology patients.

There was no control group for this study, only a group that was receiving the CAM therapy and not a group that was not receiving CAM therapy.

There were no tools to assess the findings of this study, just the parents and patient's perception and appearance of how CAM works.

Purpose Statement: Explore the effects of slow-stroke back massage (SSBM) on hospitalization anxiety and physiological parameters in school-age children

Research question:

Setting: Ali Ebne Abi Taleb hospital in Zahedan, Iran.

Sampling Method:

Sample size: 101

Design: Randomized Control Trial

Level of Evidence: 5

Results showed that massage reduced hospitalization anxiety, PR, and BP

This study suggests that the use of massage as a therapeutic agent would be useful in the hospital to decrease the anxiety and distress of a child.

Limitations of this study include the inability to control potential intervention variables, such as emotional, physical, and social conditions of each child being studied. An additional limitation was a delay in the implementation of the intervention due to interruptions.
### COMPLEMENTARY THERAPIES, MENTAL STATUS, ONCOLOGY

<table>
<thead>
<tr>
<th>Journal</th>
<th>Title</th>
<th>Abstract</th>
<th>Methods</th>
<th>Results</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Crescent medical journal</em>, 18(11), e36567. doi:10.5812/ircmj.36567</td>
<td>Does the intervention of a SSBM decrease the amount of hospitalization anxiety and psychological parameters in school-age children?</td>
<td>Random sequential sampling</td>
<td>Sample Size: 80</td>
<td>HT appeared to be well accepted by subjects from a variety of ethnic backgrounds. Several patients had attitudes/beliefs around health care that were rooted in their traditional cultural values, but this was not universal. Knowledge of different cultural attitudes on health, and traditional/complementary medicine, will improve patient care. Future areas of research could examine the acceptance of HT among pediatric oncology patients in geographic areas with differing cultural demographics.</td>
<td>This study implicates that having a broader understanding of cultures, as well as utilizing HT in differing cultures will aid in the acceptance of HT.</td>
</tr>
</tbody>
</table>

10 Ghiasuddin, A., Wong, J., & Siu, A. M. (2015). Ethnicity, traditional healing practices, and attitudes towards complementary medicine of a pediatric oncology population receiving healing touch in Hawaii. *Asia-Pacific Journal of Oncology Nursing*, 2(4), 227–231. [https://doi.org/10.4103/2347-5625.158015](https://doi.org/10.4103/2347-5625.158015) | Purpose Statement: feasibility of delivering Healing Touch (HT) to pediatric oncology patients, and its impact on pain, distress and fatigue. | Setting: Honolulu | Design: Randomized prospective Study | HT appeared to be well accepted by subjects from a variety of ethnic backgrounds. Several patients had attitudes/beliefs around health care that were rooted in their traditional cultural values, but this was not universal. Knowledge of different cultural attitudes on health, and traditional/complementary medicine, will improve patient care. Future areas of research could examine the acceptance of HT among pediatric oncology patients in geographic areas with differing cultural demographics. | This study implicates that having a broader understanding of cultures, as well as utilizing HT in differing cultures will aid in the acceptance of HT. |

11 Adams D, Spelliscy C, Sivakumar L, et al. CAM and pediatric oncology: where are all the best cases? *Evid Based Complement Alternat Med*. 2013; 2013: 632351. | Purpose statement: to identify if “best cases” associated with CAM use existed in pediatric oncology and to compare the utility of three different approaches to case identification (steps I, II, and III). | Setting: Canadian and U.S. Children’s Oncology Groups | Design: Non-experimental | The majority of the cases involved the use of traditional Chinese medicine (TCM) to improve the quality of life (*Table 1*). Of note, seven cases were submitted by the CAM practitioner employed in the CAM treatment center of the oncology hospital rather than the CAM practitioner employed in the CAM treatment center of the oncology hospital. | They have initiated discussions with North American pediatric integrative oncology centers, as identified through the Society for Integrative Oncology (SIO) and COG CAM Special Interest Group, to set up a collaborative Pediatric Best-Case Series. Our hope is that by pooling and categorizing best cases, we can provide resources across geographic areas to aid with implementation of CAM. |

<table>
<thead>
<tr>
<th>Notes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The study was strong was the selection of the participants, but a lot of the selections then had to be thrown out due to not having that strong of positive CAM outcomes.</td>
<td>The study was strong was the random assignments and having a control and experimental group and then it was weak because the sample size was very small.</td>
</tr>
</tbody>
</table>
Oncologists were asked to recall patients who met the following criteria: under 18 when diagnosed with cancer; diagnosed between 1990 and 2006; had, in their opinion, unexpectedly positive clinical outcome (as defined by tumor regression, prolonged survival, and/or improved quality of life); and reported CAM use during or after cancer treatment. Sample size: 17

than the oncologist, as the oncologist referred the request directly to the CAM practitioner. These seven cases represented a small portion of the patients treated with CAM in their center; however, due to time constraints, not all the cases were summarized and submitted.

is to identify these elusive cases and thereby generate hypotheses to support research that may benefit children with cancer.
|---|
| **Purpose Statement:** The purpose of this study was to provide opportunity for development of music therapy.  
**Research Question:** How does music therapy contribute to the symptom management of pediatric oncology patients?  
**Setting:** Royal Children’s Hospital and Health Services District, Brisbane, Queensland, Australia  
**Sampling Method:** Convenience Sampling; samples of the families of cancer patients within the hospital.  
**Sample Size:** 38  
**Design:** Non-experimental; survey  
**Level of Evidence:** 5  
**Overall, this survey shows that families believe that music therapy has aided in the overall health of their child with pediatric cancer.** |
| **Purpose statement:** propose an intervention and safety protocol for performing animal-assisted therapy (AAT) and evaluating its efficacy in children under outpatient oncological treatment based on psychological, physiological, and quality of life indicators for the children and caregivers.  
**Research Question:** How does animal assisted therapy affect children undergoing cancer treatment?  
**Setting:** AAT program  
**Sampling method:** outpatient care at a children’s oncology hospital  
**Sample size:** 24  
**Design:** Quasi-Experimental  
**Level of Evidence:** 5  
**Among the children, significant improvement was observed in the pain levels, irritation and stress, and a tendency towards a decrease was observed for depressive symptoms with large or very large effect sizes. No significant changes in the physiological indicators were observed.**  
**In conclusion, the proposed program was** |
<p>| 14 W.H.C. Li, K.Y. Ho, K.K.W. Lam, H.S. Lam, S.Y. Chuic, G.C.F. Chan, ..., O.K. Chung | Purpose Statement: Study the effectiveness of adventure-based training on the promotion of physical activity, reduction of fatigue, and enhancement of self-efficacy and quality of life in pediatric cancer survivors. Research Question: Does regular physical activity aid in relieving cancer-related fatigue? Setting: Hong-Kong China Sampling Method: Simple Complete Randomization; Convenience Sample Size: 222 Design: Experimental; Randomized Controlled Trial Level of Evidence: 5 Results support the effectiveness of adventure-based training to promote physical activity, decrease fatigue, and increase the pediatric patient’s self-efficacy and quality of life This study implicates that the use of regular physical activity in one’s treatment regime may aid in the overall general wellness of pediatric cancer patients. The results of this study may be limited in their generalizability due to the fact that a convenience sample was utilized. | effective for children in outpatient oncological treatment considering the quantitative effect on the analyzed variables, and the selection criteria and safety precautions adopted for the participants, dogs, and hospital environment were adequate considering the acceptance of the program by the medical team and the lack of complications. | 15 Valeria Rocha, Elena J. Ladas, Meiko Lin, Walter Cacciavillano, Elizabeth Ginn, Kara M. Kelly, … Luis Castillo. (2017). Beliefs and Determinants of Use of Traditional Complementary/Alternative Medicine in Pediatric Patients Who Undergo Treatment for Cancer in South America. <em>Journal of Global Oncology</em>, (6), 701. Purpose statement: Investigate the patterns and beliefs around the use of complementary / alternative therapies in South America. Purpose question: To what extent does the South American population use complementary Traditional complementary and alternative therapies (TCAM) were common in both Argentina (47%) and Uruguay (76%). The wealth index and TCAM belief system were significant predictors of TCAM The implications of this study look at why different countries use TCAM. Several countries rely on it as a supportive care, yet others for faith and healing. This is relevant because if we know why a population uses a certain therapy, we can determine what the role of TCAM to enhance already existing supportive care regimens, especially where access to standard care is limited to the patient. The study did not evaluate the The survey was provided to the patient and their families in a medical setting, unsure whether |</p>
<table>
<thead>
<tr>
<th>Title</th>
<th>Purpose statement:</th>
<th>Setting</th>
<th>Design</th>
<th>Level of Evidence</th>
<th>Purpose</th>
<th>Setting</th>
<th>Design</th>
<th>Population hopes to gain from it.</th>
<th>TCAM care may or may not be vastly different in other countries in South America due to the size, diversity, and access to healthcare in different countries.</th>
<th>Due to limited sample size, unable to determine whether the use of TCAM use fluctuates during various phases of therapy.</th>
<th>Absence of long-term effects of Reiki sessions.</th>
<th>Since this is the first pilot study of the effectiveness of Reiki on cancer pain, these results must be confirmed by further studies with a larger sample of patients.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Zucchetti, G., Candela, F., Bottigelli, C., Campione, G., Parrinello, A., Piu, P., … Fagioli, F. (n.d.). The Power of Reiki: Feasibility and Efficacy of Reducing Pain in Children With Cancer Undergoing Hematopoietic Stem Cell Transplantation. JOURNAL OF PEDIATRIC ONCOLOGY NURSING, 36(5), 361–368. <a href="https://doi.org/10.1177/1043454219845879">https://doi.org/10.1177/1043454219845879</a></td>
<td>Purpose statement: Reiki is an emerging complementary therapy in pediatric cancer patients that needs further evidence to become more credible in the health community. Purpose question: What is the feasibility and efficacy of Reiki to provide pain relief among pediatric patients undergoing hematopoietic stem cell transplantation (HSCT)?</td>
<td>Setting: hospital</td>
<td>Design: Experimetal; cross-sectional</td>
<td>Level of Evidence: 5</td>
<td>A decrease of pain occurred in the experimental period in short and medium term, while in the follow-up period, the pain level remained stable.</td>
<td>This study implicates that Reiki therapy is a valid form of CAM when used in acute pain, but has no effects on long term pain.</td>
<td>the use of TCAM hinders access to standard therapy.</td>
<td>TCAM care may or may not be vastly different in other countries in South America due to the size, diversity, and access to healthcare in different countries.</td>
<td>Due to limited sample size, unable to determine whether the use of TCAM use fluctuates during various phases of therapy.</td>
<td>Absence of long-term effects of Reiki sessions.</td>
<td>Since this is the first pilot study of the effectiveness of Reiki on cancer pain, these results must be confirmed by further studies with a larger sample of patients.</td>
<td></td>
</tr>
<tr>
<td>17 Celebioglu, A., Gurol, A., Yildirim, Z. K., &amp; Buyukavci, M. (2014). Effects of massage therapy on pain and anxiety arising from intrathecal therapy or bone marrow aspiration in children with cancer. INTERNATIONAL JOURNAL OF NURSING PRACTICE, 21(6), 797–804. <a href="https://doi.org/10.1111/ijn.12298">https://doi.org/10.1111/ijn.12298</a></td>
<td>Purpose statement: Investigate the effect of massage therapy on pain and anxiety arising from intrathecal therapy or bone marrow aspiration in children with cancer. Purpose question: Does massage therapy decrease the pain and anxiety of intrathecal therapy or bone marrow aspiration in children with cancer.</td>
<td>Setting: hospital</td>
<td>Design: Quasi-experimental study</td>
<td>Level of Evidence: 5</td>
<td>Pediatrics cancer patients were given a 15 minute massage before intrathecal therapy or bone marrow aspiration treatments which resulted in a lower level of pain and anxiety after the procedure. Massage therapy also made patients more cooperative, peaceful, and</td>
<td>This study implicates positive outcomes (cooperation, peacefulness, comfortability, decreased pain and anxiety) when massage therapy is used for pediatric cancer patients before procedures such as intrathecal therapy or bone marrow aspiration.</td>
<td>the use of TCAM hinders access to standard therapy.</td>
<td>TCAM care may or may not be vastly different in other countries in South America due to the size, diversity, and access to healthcare in different countries.</td>
<td>Due to limited sample size, unable to determine whether the use of TCAM use fluctuates during various phases of therapy.</td>
<td>Absence of long-term effects of Reiki sessions.</td>
<td>Since this is the first pilot study of the effectiveness of Reiki on cancer pain, these results must be confirmed by further studies with a larger sample of patients.</td>
<td>The sample size was small and self-selected. Only a visual analog scale (VAS) was used to assess pain and anxiety. For children under the age of 5 the mother evaluated the patient’s pain and anxiety.</td>
</tr>
<tr>
<td>Study Reference</td>
<td>Purpose Statement</td>
<td>Setting</td>
<td>Design</td>
<td>Level of Evidence</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------</td>
<td>---------</td>
<td>--------</td>
<td>-------------------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uglow, L. S. (2019)</td>
<td>Effectiveness of animal-assisted intervention (AAI) on pediatric patients.</td>
<td>Hospital, online survey</td>
<td>Non-Experimental; cross-sectional</td>
<td>5</td>
<td>AAI was used throughout a children's hospital to attend to patients going through chemotherapy, treatments, blood draws, etc. which had outstanding results including decreased depression, increased oxygen saturation, and decreased anxiety. This study implicates that AAI has positive outcomes and should be available to patients in more hospitals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheri L., R., Joan E., H., Susan M., P., Paul R., H., Amanda K., H., Kathleen A., K., &amp; Yan, T. (2017)</td>
<td>To examine the feasibility/acceptability of a parent-delivered Active Music Engagement (AME+P) intervention for young children with cancer and their parents. Explore changes in AME+P child emotional distress and parent emotional distress relative to controls.</td>
<td>Hospital</td>
<td>Experimental; Randomized Trial</td>
<td>5</td>
<td>In conclusion, the AME+P intervention was feasible for parents, but interviews indicated it was not acceptable for parents. The emotional distress was lowered in children, but had no benefits on the parents. This study implicates that perhaps music therapy is effective because it was effective in lowering emotional distress in children, but the methods used to achieve this outcome may not have been the most effective due to lack of benefits for the parents.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stein, E., Rayar, M., Krishnadev, U., Gupta, A., Hyslop, S., Plenert, E., … Sung, L. (2019)</td>
<td>Determine the feasibility of a 10-week, weekly individualized yoga intervention for children and adolescents receiving outpatient cancer therapy and describe depression, anxiety, fatigue,</td>
<td>Hospital, Skype</td>
<td>Experimental; Exploratory design</td>
<td>4</td>
<td>This study was conducted on 10 participants over the course of a year in which they attended 61 yoga sessions. After the study, all participants agreed that the yoga program helped. The study implicated that although a study like this would most likely not be feasible, they collected important data that can be of use for future studies. the most important outcome for the study was conducted at only one institution with a very small sample size in which not all participants completed the study. The study was conducted at only one institution with a very small sample size in which not all participants completed the study. The yoga instructors were volunteers which may have had a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Purpose statement: Assess the prevalence and patterns of CAM use among pediatric oncology outpatients in two academic clinics in Canada.

Purpose question: What are the pediatric cancer patients current or previous use of CAM products and practices?

Setting: hospital in Canada
Sampling method: convenience sampling
Sampling size: 129
Design: Non-Experimental; cross-sectional
Level of Evidence: 5

The most popular CAM products were multivitamins and the most popular CAM therapy sought by pediatric oncology patients was faith healing. Patients who do not use CAM feel that they do not know enough about it, including potential side effects. Simultaneous use of multiple CAM with conventional treatment can lead to clinically relevant drug interactions. To ensure that patients use evidence-based information of the highest quality in their decision making so as to maximize efficacy and ensure safety, pediatric oncology clinics and healthcare providers need to play a greater role.

This study implicates that use of CAM is highly prevalent in pediatric oncology and is seen as helpful and safe. According to the study, families are more likely to use CAM for pediatric oncology when educated by their physician.

Limited by dependence on recall of past events by a proxy response.

Findings may be limited in their generalizability because the survey was only administered in English or French.