

## Complementary and Alternative Medicine in the Pediatrics with Leukemia: A Narrative Review Study

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### Abstract

#### Background

For using of complementary and alternative medicine methods (CAM) in the leukemia pediatrics than other types of cancer, we have two great challenges; first challenge is their safety and risks and second challenge is study gaps in this field. Regarding to these challenges, this study is a narrative review of some CAM methods in the leukemia pediatrics from the perspective of their safety, risks and study gaps.

#### Materials and Methods

In this narrative review study searched both international electronic databases including ISI Web of science, PubMed, PsycINFO, CINAHL, ISC, Embase, Scopus, Google Scholar and also, Iranian electronic databases including Magiran, Medlib and SID. Also, searches were performed separately in the specialized journals in the field of leukemia pediatrics and complementary and alternative medicine research.

#### Results

Music therapy, gentle yoga movements, gentle massage types are quite safe for leukemia pediatrics. But, use of heavy yoga movements, massages with deep pressure, acupressure and acupuncture can be dangerous for leukemia pediatrics (risks of bleeding and or infection). Also, this study showed that, the number of investigations about the use of CAM in the leukemia pediatrics is very limited; especially in the field of yoga and acupuncture.

#### Conclusion

The results of this study can be a basis both for chose of safe CAM method in these children and a basis for future studies on the basis of identified study gaps in this review study.

**Key Words:** Complementary Medicine, Leukemia, Pediatric, Review.

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## 1- INTRODUCTION

Leukemia is among hematologic malignance, which have various types and subtypes including acute lymphocytic leukemia (ALL), acute myelogenous leukemia (AML), chronic lymphocytic leukemia (CLL) and chronic myelogenous leukemia (CML) (1, 2). Leukemia is the most common cancer in children (3, 4). Approximately, 32 percent of all pediatric with cancer have leukemia (4). Pediatrics with leukemia are experiencing difference side-effects which induced by disease and its treatments. These side-effect are include pain, sleep disturbance, fatigue, anxiety, nausea and vomiting, anxiety, stress, depression, etc. (2, 5-7). For controlling these problems, we can use of pharmacological and non-pharmacological methods (such as complementary and alternative medicine methods). Pharmacological methods are not efficient singly for controlling symptoms and also, they have undesirable side-effects; whereas, complementary and alternative medicine methods can be safe for patients. Nowadays complementary and alternative medicine methods beside Pharmacological methods using together for controlling symptoms in the cancer patients.

Complementary or alternative Medicine methods, defined as group of complex interventions that generally are not part of conventional and mainstream medicine

(8, 9). Benefits of CAM use in pediatrics include improving the immune system, controlling side-effects of cancer treatments, preventing the relapse of cancer and its side-effects and finally improving general health of children with cancer (10, 11). **Table.1** presenting various types of complementary and alternative medicine (8, 12).

For using of CAM in the leukemia pediatrics than other types of cancer, we have two great challenges. First challenge (safety and risks): the majority of pediatrics with leukemia have neutropenia and thrombocytopenia, and these pediatrics are at risks of infection or bleeding induced neutropenia and thrombocytopenia (1). Hence, use of certain CAM methods which using in other types of cancer, can be dangerous in the leukemia pediatrics (9, 13, 14). Second challenge (study gaps): the clinical trials in this field of CAM in the pediatrics with leukemia, is limited. Therefore, evidence-base and our knowledge are not enough for making better practical decision (9). Regarding to these challenges, this study aimed was a narrative review of some complementary and alternative medicine methods in the leukemia pediatrics from the perspective of their safety, risks and study gaps.

**Table-1:** Types of complementary and alternative medicine methods

Categories	Examples
Alternative Medical Systems	Acupuncture Ayurveda Homeopathy Naturopathy Chinese or Oriental medicine
Mind-Body Interventions	Patient Support Groups Yoga Meditation Prayer Mental Healing

	Art Music Dance
Biologically Based Therapies	Dietary supplements Herbal medicine Nutrition/diet
Manipulative and Body-Based Methods	Chiropractic Osteopathic Manipulation Massage Acupressure
Energy Therapies	Qi Gong Reiki Therapeutic Touch Pulsed Fields Magnetic Fields Alternating-current or direct-current fields

## 2- MATERIALS AND METHODS

### 2-1. Search period

The present investigation was a narrative review design including Iranian and foreign studies up to 2016. The initial searches were performed from January 2014 to May 2015. Also, the search was updated in May 2016.

### 2-2. Source of information

In this review study searched both international electronic databases including ISI Web of science, PubMed, PsycINFO, CINAHL, ISC, Embase, Scopus, Google Scholar and also, Iranian electronic databases including Magiran, Medlib and SID. Also, searches were performed separately in the specialized journals in the field of leukemia pediatrics and complementary and alternative medicine research.

### 2-3. Search terms

The search terms were combinational forms included (leukemia OR AML OR ALL OR CML OR CLL) AND (clinical trial, quasi-experimental) AND (complementary, alternative, palliative, supportive) AND (Massage OR Acupuncture OR Acupressure OR Music

OR Yoga) AND (side-effect OR risk OR safety OR benefit OR advantage OR disadvantage) AND (pediatric OR children OR childhood). This terms which used for search were both Persian and English languages.

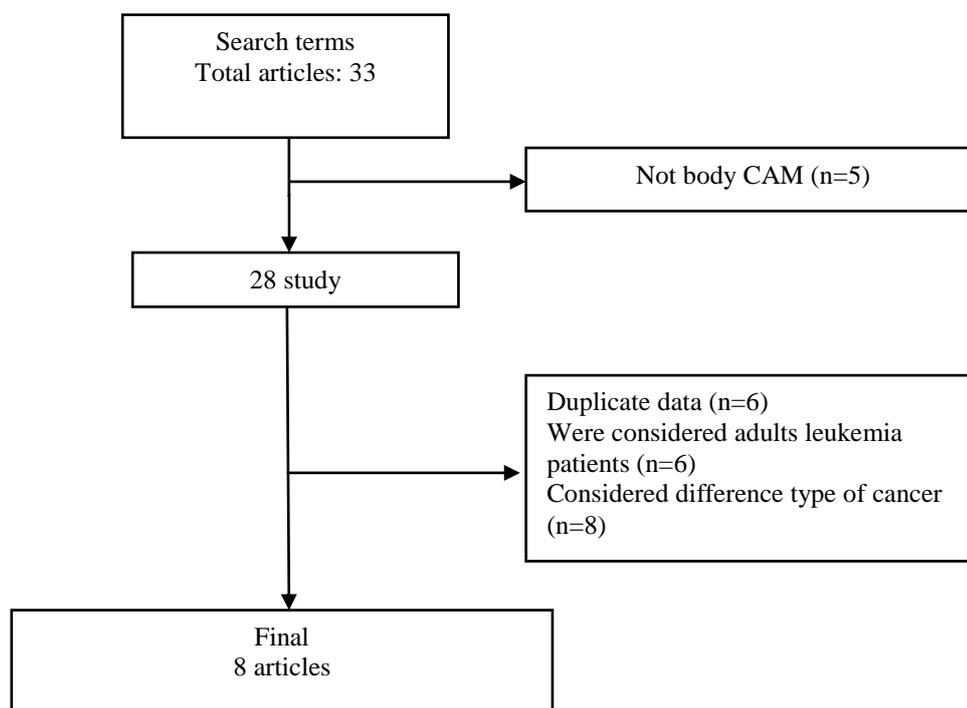
### 2-4. Selection criteria employed

In this review study, selection criteria were as follow:

- Only clinical trial studies,
- Studies which were used CAM only on the leukemia pediatrics, and
- We did not considered studies that was conducted generally on the pediatrics with cancer (because, some clinical trial studies considering various types of cancer, whereas cancer nature, symptom's severity, treatment regimens, etc. are difference in the each type of cancer).

In this study, we assessed the most widely used and most popular methods of CAM.

Three authors independently selected studies according to the selection criteria, and differences were resolved by a forth reviewer (**Figure.1**).



**Fig.1:** Flow diagram of study

### 3- RESULTS

In this section, we description safety, risks and study gaps about use of some most popular methods of CAM in the pediatrics with leukemia. Finally we found 8 clinical trials in field of using complementary and alternative medicine in the pediatrics with acute leukemia.

#### 3-1. Music Therapy

In the literature review, we found only 2 clinical trial studies in this field. Study by Kemper et al. (USA) was conducted about the effects of music therapy on anxiety, stress and depression in children with acute leukemia (15). Study by Nguyen et al. (Vietnam) was performed with the aim of the music therapy effects on pain and anxiety in leukemia children undergoing lumbar puncture (16). Generally, studies about effect of music therapy in leukemia pediatrics are limit and we have study gap

in this field. In the future clinical trial investigations should be studied the effects of music therapy on other problems of these pediatrics (such as on the sleep disorders, nausea and vomiting, fear, fatigue, etc.). Another studies in the future, are need for study gaps in this field.

#### 3-2. Yoga Therapy

In the literature review, we didn't reach to publish clinical trial study which conducted to the effects of yoga therapy in the leukemia pediatrics. Studies are need for study gaps in this field. We should assess the effects of yoga on the various problems of leukemia pediatric in future studies.

#### 3-3. Massage Therapy

In the literature review, we found 4 clinical trial studies in this field. Two studies by Miladinia et al. (Iran) were conducted to the effects of slow-stroke back massage on

the anxiety, nausea and vomiting in the leukemia pediatrics (14, 17). Study by Han et al. (Korea) was conducted about the effects of hand massage on anxiety, nausea and vomiting in childhood with leukemia (18). Another study by Field et al. (USA) was conducted about the Leukemia immune changes following massage therapy (19). In the future clinical trial investigations should be studied the effects of massage therapy on other problems of these children (such as pain, fatigue, sleep disturbance and etc.). Also, we need assess various types of massage therapy (which type of massage is more effective for leukemia pediatrics?).

### 3-4. Acupuncture

In the literature review, no study was found on the effects of acupuncture in the leukemia pediatrics. Hence, studies are need for assessment of effects of acupuncture in leukemia pediatrics, but only in leukemia pediatrics, that have good condition of neutrophil and platelet levels. Also, we need assess that, what levels of neutrophil and platelet, are contraindication for using of acupuncture in these pediatrics.

### 3-5. Acupressure

In the literature review, we found 2 clinical trial studies in this field. Study by Bastani et al. (Iran) was conducted to the effect of acupressure method on cancer-related fatigue in pediatrics with ALL (20). Another study by Hussein and Abdel Sadek (Egypt) was conducted to the effect acupressure on chemotherapy-induced vomiting in leukemia pediatrics (21). Generally, investigation about effect of acupressure in leukemia pediatrics is limit. In the future clinical trial investigations should be studied the effects of this method on other problems of these pediatrics (such as on the sleep disorders, pain, fear, anxiety and etc.). Another studies in the future are need for study gaps and also its safety in this field.

Finally, **Table.2** showing clinical trial studies which performed. We found 8 clinical trials in field of using complementary and alternative medicine in the pediatrics with acute leukemia. According to **Table.2**, we need more researches in this field in pediatrics with leukemia.

**Table-2:** Clinical trial studies which performed

Intervention	Study, year	Sample size	Protocol of treatment	Main findings
Massage therapy	Miladinia (2016)(14)	35 patients	5-minute slow-stroke back massage (SSBM) sessions, 3-time a week (every other day) for 4 weeks.	Slow-stroke back massage is effective for controlling anxiety in children with chronic leukemia.
Massage therapy	Miladinia (2015)(17)	40 patients	5-minutes slow-stroke back massage, immediately before start of each session of chemotherapy.	Slow-stroke back massage is effective in controlling Chemotherapy-induced nausea and vomiting (CINV) in the pediatrics with acute leukemia.
Massage therapy	Han (2008)(18)	30 patients	The hand massage was performed for 10 minutes twice a day over three days.	Hand massage could be effective in decreasing nausea and vomiting and state anxiety in children with acute leukemia receiving high dose chemotherapy.
Massage therapy	Field (2001)(19)	20 patients	The parents were instructed to give the 15-min massage before bedtime every day for 30 days.	After massage therapy, children's white blood cell and neutrophil counts increased.

Acupuncture	-	-	-	Did not found any study.
Yoga	-	-	-	Did not found any study.
Music therapy	Kempur, 2008 (15)	47 patients	20 min of Doc Childre's Heart Zones compact disk (CD); in a quiet treatment room.	Music therapy led to improvement in relaxation and parasympathetic parameter of patients.
Music therapy	Nguyen 2010 (16)	40 patients	Pain scores measured before, during, and after the procedure. Anxiety scores were measured before and after the procedure.	Music therapy led to a positive experience by the children undergoing lumbar puncture, including less pain and fear.
Acupressure	Bastani (2015) (20)	120 patients	The intervention (finger acupressure) was applied on ST36 (true points) in the experimental group and on LI12 (sham points) in the placebo group.	Applying one time acupressure may reduce the intensity of fatigue at 1 h post-treatment.
Acupressure	Hussein (2013) (21)	50 patients	The total program included 6 sessions (2 sessions offered in one hour/day) and this program was carried out during week.	Acupressure could be effective in the management of vomiting associated with chemotherapy in children with leukemia.

#### 4- DISCUSSION

Music therapy is a mind-body intervention (cognitive-behavioral), which could have psychological, spiritual, social and physical effects (22, 23). In the music therapy, we have no any manipulation acts, hence this method doesn't risks of bleeding or infection and it's quite safe for pediatrics with leukemia, especially for leukemia pediatrics who have severe leukopenia or thrombocytopenia.

Yoga is another form of mind-body medicine which combining Pranayama (breathing exercises) with Asanas (specific postures), and finally creating an equilibrium between the body and the mind status (24). Yoga can improve physical, mental, and spiritual (25). For a safe yoga therapy in leukemia pediatrics, we should use of gentle yoga movements and abstain of very active movements. Use of heavy yoga movements in these children can be dangerous. Hence, studies are need for assessment of safe yoga movements for leukemia pediatrics.

Massage therapy is a scientific and physical manipulation (26), which could

have physiological, psychological, neurological and biomechanics effects (27). Massage therapy have various types with different ranged from gentle touch to deeper pressure (9). In the leukemia pediatrics, we should use of gentle massage types, which are safe for these children; but, use of massage with deep pressure can be dangerous for these pediatrics (risk of bleeding); especially for leukemia pediatrics who have severe thrombocytopenia.

Acupuncture as one of the Chinese medicine with ancient history, is applying needles to the specific points of body (28). Use of this method for leukemia pediatrics can be dangerous (risks of bleeding and infection), especially for leukemia pediatrics who have severe leukopenia or thrombocytopenia. In the acupressure uses fingers or elbow for physical pressure to acupuncture points of body which had high capability in the energy direction. Actually, the main aim of acupressure method is to raise energy (2, 29). Acupressure, unlike acupuncture method, does not have risk of infection and is safer. But, this method such as acupuncture has

risk of bleeding. Hence, this method for leukemia pediatrics with leukopenia is safe, but in leukemia pediatrics with thrombocytopenia can be dangerous (lower than 50.000 platelet, have contraindication) (9).

**Table.3** shows the safety and risks of CAM methods and clinical trial studies which performed. According to **Table.3**, we need more researches in this field in pediatrics with leukemia.

**Table-3:** Safety and risks of CAM methods and Clinical trial studies which performed

Methods	Safety and risks in leukemia pediatrics	Studies which performed in the leukemia pediatrics
Music therapy	Quite safe	Only 2 clinical trials
Yoga <ul style="list-style-type: none"> <li>▪ gentle movements</li> <li>▪ heavy movements</li> </ul>	Safe Risk of bleeding	Only did not found any study
Massage therapy <ul style="list-style-type: none"> <li>▪ gentle pressure types</li> <li>▪ deep pressure types</li> </ul>	Safe Risk of bleeding	Only 4 clinical trials
Acupuncture	Risks of bleeding and infection	Did not found any study
Acupressure	Risk of bleeding (in platelet lower than 50.000)	Only 1 clinical trial

#### 4-1. Limitations of the study

Few studies were included in narrative review study. Meanwhile, in the some CAM methods, we did not find any study on the leukemia pediatrics.

#### 5- CONCLUSION

The results of this review study showed that, some methods of CAM can be dangerous for leukemia pediatrics. Music therapy, gentle yoga movements, gentle massage types are quite safe for leukemia pediatrics. But, use of heavy yoga movements, massages with deep pressure, acupressure and acupuncture can be dangerous for leukemia pediatrics (risks of bleeding and or infection). Also, this study showed that, the number of investigations about the use of CAM in the leukemia pediatrics is very limited (especially in Iran). The results of this study can be a

basis for future studies on the basis of identified study gaps in this review study.

**6- CONFLICT OF INTEREST:** None.

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