

## Review Paper

## Complementary and Alternative Medicine in Treating Children's Diseases in Iran: A Systematic Review

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## ABSTRACT

**Background:** All across the world, complementary and alternative medicine (CAM) is frequently used to treat children. Due to the increasing use and tendency to complementary therapies in Iranian children.

**Objectives:** This systematic review aims to synthesize the existing evidence on the use of CAM the treatment of children's diseases in Iran.

**Methods:** This was a systematic review study. A search was done on published clinical trials, qualitative, observational, and quasi-experimental studies from January 1, 2020, to January 3, 2023, in nine scientific research databases, namely PubMed, Science Direct, Wiley Online, Scopus, SciELO, LILACS, Google Scholar, Magiran, and SID. The keywords used in English were as follows = (("Complementary medicine" OR "alternative medicine" OR "CAM" OR "integrative medicine" OR "traditional medicine" OR "herbal medicine" OR "acupuncture" OR "homeopathy" OR "cupping therapy" OR "massage therapy" OR "aromatherapy" OR "naturopathy" OR "spiritual healing" OR "larval practice" OR "music therapy" OR "reflexology") AND ("pediatric" OR "child" OR "children" OR "adolescent" OR "infant") AND ("Iran") AND ("prevalence" OR "epidemiology" OR "frequency" OR "usage" OR "utilization" OR "incidence")). Meanwhile, the preferred reporting items for systematic reviews and meta-analysis guidelines were followed to ensure a rigorous and transparent review process.

**Results:** The initial search yielded 865 articles. After removing duplicates and screening titles and abstracts, 808 were excluded for not meeting inclusion criteria, resulting in 26 full-text articles selected for the analysis. These studies examined a variety of CAM interventions, including mind-body techniques (e.g. music therapy, meditation), manipulative methods (e.g. massage, cupping therapy), and physiologically based therapies (e.g. herbal medicine, aromatherapy). CAM methods were most frequently employed to address various conditions, such as pain and anxiety, attention deficit hyperactivity disorder symptoms, respiratory distress syndrome, diabetes, functional constipation, sleep disorders, and cancer-related symptoms in children. The findings indicate a significant role of CAM therapies in symptom management and improving quality of life.

**Conclusions:** AM modalities, particularly mind-body and physiologically based therapies, are frequently used among Iranian children to manage specific health conditions. Further research is recommended to evaluate CAM therapies' safety, effectiveness, and interactions with conventional treatments to optimize integrated pediatric care in Iran.

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## Introduction

The World Health Organization (WHO) identifies complementary and alternative medicine (CAM) as medical systems, practices and products that are separate from conventional medicine [1]. The national center for CAM describes CAM as a group of medical systems, practices, and products that are not normally found in conventional medicine [2]. This center categorizes complementary and alternative medical practices into five areas: Alternative medical systems, mind-body therapies, biologically based therapies, and manipulative and body-based therapies. Each area offers distinct therapeutic modalities, including traditional Eastern medicine, acupuncture, Ayurveda, naturopathy, and homeopathy [3], [4, 5]. Popular CAM therapies include acupuncture, aromatherapy, yoga, and herbal supplements [6].

In various countries, the use of CAM among children is prevalent, particularly for managing chronic illnesses and enhancing quality of life. For example, 6% to 91% of children with cancer globally report using CAM [7, 8]. Research on children's CAM use in Europe shows 56% used traditional and complementary medicine [9], while surveys conducted in Turkey revealed that traditional and complementary medical treatments were used by 56.5% to 87% of children [10]. Studies from Australia [11], Switzerland [12], and Saudi Arabia [13] suggest that using CAM is prevalent for addressing various health conditions. In Iran, CAM is particularly significant due to cultural influences that encourage traditional and herbal remedies [14]. However, despite its widespread use, CAM practices are often not disclosed to healthcare providers, either due to beliefs in the harmlessness of these treatments, fear of medical disapproval, or assumptions about healthcare providers' limited knowledge of CAM [15].

The rationale for this review is to address the limited research on CAM use specifically among Iranian pediatric populations. Although studies indicate that CAM use is high among children in Iran [16], especially for chronic conditions, comprehensive data on the forms of CAM used, reasons for use, and perceived efficacy are lacking. This gap highlights the need for a systematic review to consolidate and synthesize existing evidence. This review provides insights that can inform healthcare policy, guide educational efforts in healthcare training programs, and support healthcare providers in advising parents on CAM practices. Ultimately, this information may help optimize CAM use, prevent potential misuse, and improve pediatric care in Iran.

## Methods

To comprehensively evaluate the evolving landscape of the use of CAM in the treatment of children's diseases in Iran, a systematic approach was crucial, given the burgeoning literature in this area. We used the preferred reporting items for systematic reviews and meta-analyses checklist to ensure that the systematic review's reporting was of high quality [17]. The checklist, which includes four sequential processes (identification, screening, eligibility and inclusion) and 27 elements, was intended to help writers perform more effective systematic reviews (Figure 1).

### Research questions and objectives

**Research question 1:** What are the main types of CAM methods used in the treatment of children's diseases in Iran?

**Research question 2:** What are the primary reasons for using CAM among pediatric patients in Iran?

The objective of this systematic review is to provide a comprehensive understanding of the various forms, uses, and perceptions of CAM in treating pediatric patients in Iran. By systematically evaluating the existing literature, this review aims to investigate the following items:

Identify and classify the CAM methods used for treating children's diseases in Iran; assess the reasons for CAM use among caregivers and healthcare providers for pediatric patients; develop evidence-based recommendations to inform healthcare professionals, policy-makers, and educators on integrating CAM safely and effectively within pediatric healthcare settings in Iran.

### Search technique

An investigation was done into published clinical trials, observational, quasi-experimental and qualitative investigations from January 1, 2020, to January 3, 2023, in nine scientific research databases, namely PubMed, ScienceDirect, Wiley Online, Scopus, SciELO, LILACS and Google Scholar, as well as several Persian databases including Magiran and SID. The following keywords were used in English and Persian: ["complementary medicine" OR "alternative medicine" OR "CAM" OR "integrative medicine" OR "traditional medicine" OR "herbal medicine" OR "acupuncture" OR "homeopathy" OR "cupping therapy" OR "massage therapy" OR "aromatherapy" OR "naturopathy" OR "spiritual healing" OR "larval practice" OR "music therapy" OR "reflexology"] AND ["pediatric" OR "child" OR "children" OR "adoles-

cent" OR "infant"] AND ["Iran"] AND ["prevalence" OR "epidemiology" OR "frequency" OR "usage" OR "utilization" OR "incidence"]. The initial search yielded 865 articles, out of which 808 were removed for not meeting the inclusion criteria, leaving 26 articles for analysis.

### Inclusion criteria

Studies were eligible for inclusion criteria if they passed the following criteria: 1) Clinical trials, observational, quasi-experimental, and qualitative studies; 2) Use of any type of CAM; 3) Studies focused on children and adolescents under 18 years of age; 4) Published from January 1, 2020 to January 3, 2023; 5) Studies published in English and Persian and 6) Studies with a code of ethics.

### Exclusion criteria

The exclusion criteria were as follows: 1) Lack of access to full texts; 2) Individual case reports, systematic reviews, and meta-analyses and 3) Unrelated objectives.

### Quality assessment of the articles

A critical appraisal was performed according to the study design of the articles. The critical appraisal skills program was used for analysis. The critical appraisal skills program is a 10-item questionnaire with three possible answers: "Yes," "no" and "cannot tell." If  $\geq 8$  of the criteria on the checklist were met, the study was rated as "good" quality. If 5 to 7 were met, it was rated as "fair" quality. If  $< 5$  were met, it was scored as "poor" quality. To ensure consistency and reliability in the critical appraisal process, two independent reviewers conducted the assessments. Any discrepancies in their evaluations were resolved through consensus, guaranteeing a thorough and unbiased analysis. Data were extracted from all papers that met the eligibility and inclusion criteria for the review.

### Data extraction

Two authors performed the literature search also independently followed the application of the inclusion and exclusion criteria and screened the studies based on the titles and abstracts. Adhering to the preferred reporting items for systematic reviews and meta-analyses checklist ensured a rigorous and transparent review process. The screening process was carried out for duplicates using EndNote software, version X7 (clarivate analytics). After initial screening, the full text of the studies was obtained and examined to ensure eligibility for the development of the data extraction table. Data was extracted from the final set of included full texts, encompassing

information such as the first author, the year of publication, study design, purpose, sample size, participant demographics, study setting, type of CAM intervention, and duration of intervention, instruments and measurement time used and description of outcomes associated with CAM use (Table 1).

### Results

Figure 1 presents an overview of the search strategy's outcomes. Initially, 865 articles were identified and after removing 26 duplicates, 839 references remained. A total of 31 articles met the initial inclusion criteria based on their titles, abstracts, and full texts in both English and Persian. The inclusion and exclusion criteria were then carefully reviewed for the full texts of these 31 articles, resulting in the exclusion of five papers. Ultimately, 26 papers were included in our systematic review, and information was systematically extracted from each paper, as presented in Table 1 which includes data on trial intervention, study design, participant demographics, outcome measurements, follow-up timeline, and key findings. The studies included in this review were conducted in various pediatric wards and child and adolescent outpatient clinics. Of the 26 studies included, 18 were randomized controlled trials; additionally, one study used a quasi-experimental design [18]. Other clinical trial designs were used to benefit seven additional articles.

The CAM therapies used in the included studies varied, with none of the articles utilizing energy therapy or CAM intervention. Six studies employed mind-body CAM interventions, including one relaxation method [19], one yoga [18], two congestive behavioral therapy [20, 21] and two music therapy [22, 23]. A total of 9 articles used a variety of manipulative method categories including the following items: Three acupressure [24-26], three reflexology [27-29] and four massage therapy [30]. Most of the articles ( $n=11$ ) used biologically based therapies including the following items: 11 articles on herbal medicine in the form of oil, syrup, and topical. The 26 other publications also noted a significant impact of CAM therapies on patient improvement. The studies utilized a variety of CAM therapies, with notable findings on their effectiveness as follows.

### Pain and anxiety reduction

The majority of articles (9 out of 26) demonstrated significant reductions in pain and anxiety among pediatric patients. CAM therapies such as acupressure, massage therapy, and herbal remedies were com-

monly used and consistently yielded improvements in comfort and emotional well-being.

#### Symptom management in attention deficit hyperactivity disorder

Four studies reported favorable outcomes in managing ADHD symptoms using mind-body CAM interventions such as yoga, relaxation methods, and cognitive-behavioral therapy. These therapies contributed to enhanced focus, reduced hyperactivity and improved behavioral control.

#### Management of other health conditions

Regarding diarrhea and vomiting, two studies applied herbal and nutritional CAM therapies, which helped alleviate symptoms, contributing to faster recovery. Regarding respiratory distress syndrome, one study showed improvements in breathing and reduced distress in patients receiving herbal and massage therapy interventions. In terms of diabetes and gastrointestinal disorders, conditions such as diabetes, functional constipation, gastroesophageal reflux and nephritis syndrome saw improved symptom control and quality of life in individual studies through the use of dietary and herbal CAM interventions. Regarding cancer and sleep disorders, CAM methods, including relaxation techniques and herbal treatments, were beneficial in managing sleep disorders, cancer-related symptoms and overall quality of life.

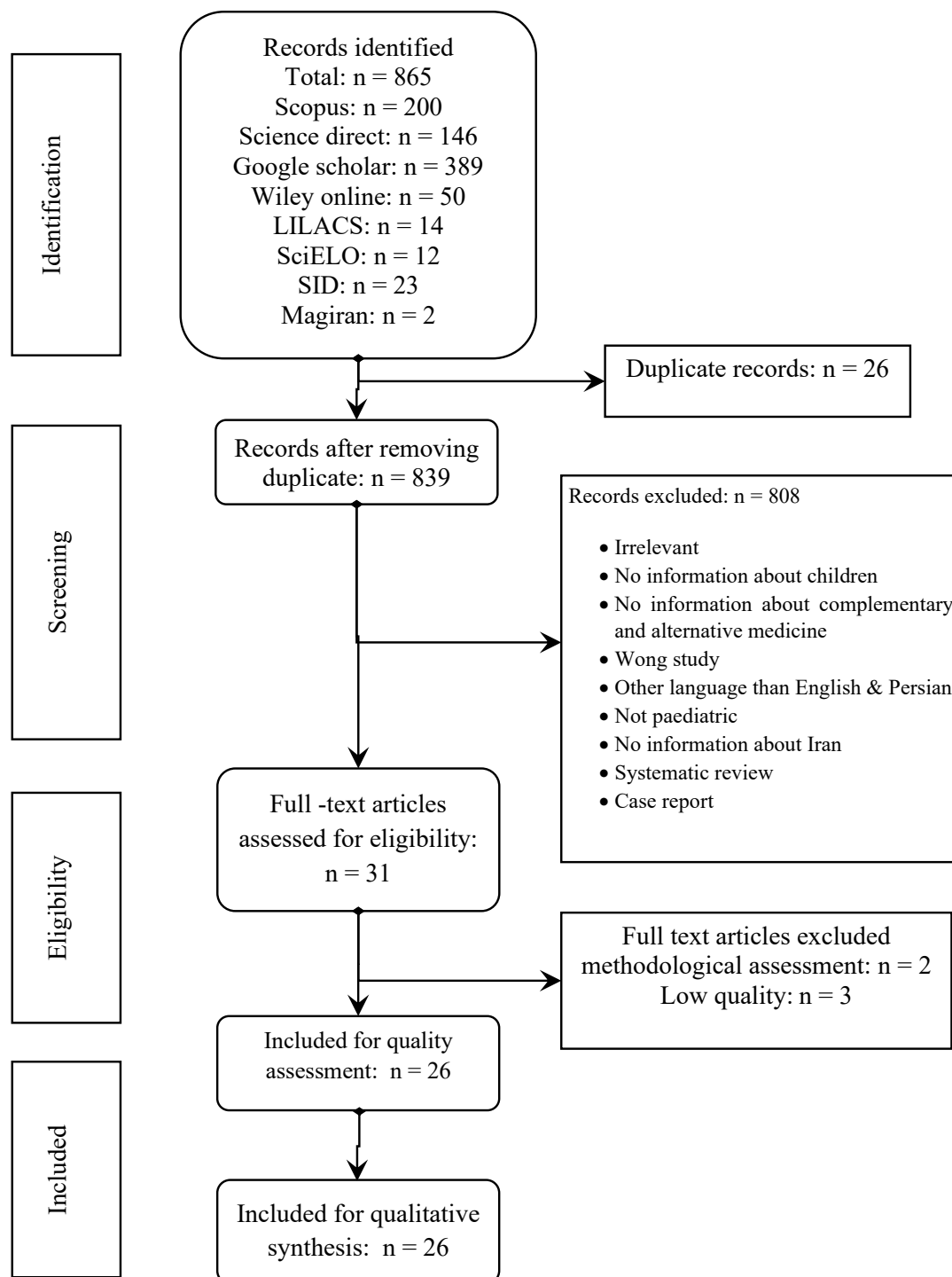
#### Biologically-based CAM therapies

The most frequently employed interventions were biologically-based, with herbal medicine featured in 11 studies in forms such as oils, syrups, and topical applications. Across these studies, herbal therapies were shown to alleviate symptoms, improve comfort and support recovery, especially in managing pain, anxiety, and gastrointestinal complaints.

#### Discussion

Our findings demonstrate that CAM use is widespread among Iranian children and adolescents, with a diverse range of modalities employed. Specifically, the most frequently utilized CAM methods identified in this review included herbal medicine (in the forms of oil, syrup, and topical treatments), massage therapy, reflexology, acupuncture, music therapy, relaxation therapy, yoga and cognitive-behavioral therapy, respectively. Our results largely support those of previous Iranian studies [44, 45] which indicated that dietary supplements, prayer, and herbal medicines are the most commonly used CAM above 17 years of age.

Similarly, Moeini et al. in 2021 have reported that in Babol, a major city in northern Iran, 30% of residents reported using herbs and herbal remedies in the previous year. The most often used techniques included music therapy, water treatment, herbal medicine, and Persian medicine [16]. These findings are consistent with those of other studies on this topic. Herbal therapy and natural products were the most frequently used treatments for children in Palestine [46], Turkey [47] and Saudi Arabia [48]. The main advantages of using herbal medicines were their ease of use, safety, satisfaction with symptom relief, and lack of concern about drug interactions [49]. Furthermore, Iranians favor herbal remedies, with manipulation body therapies like massage, reflexology, and body wrapping being the most popular CAM modalities, followed by biologically based therapies for postpartum mothers in Malaysia [50]. In contrast, in a study conducted in Brazil, acupuncture and homeopathy, as well as medicinal plants and herbal remedies, were the most frequently used CAM modalities among adult Brazilians [51]. The utilization of particular CAM modalities varies greatly across nations. These variations may be attributable to methodological issues as well as sociodemographic differences in CAM utilization among nations. This review reveals that participants most commonly used CAM modalities to alleviate pain and anxiety, which may be due to the high prevalence of pain and anxiety among children [52-54]. Similarly, Shaharban in 2022 reported that Reiki therapy is effective in controlling anxiety among children undergoing surgery [55]. These findings are consistent with those of earlier studies on this subject [56-58]. The study justifies CAM use for treating persistent illnesses like ADHD, diabetes, constipation, sleep disorders, cancer, and nephritis. Our discovery is supported by research by Pazoki et al. who found Saffron combined with Ritalin therapy can significantly reduce ADHD patients' symptoms [59]. Another Iranian study found that practicing super brain yoga helped school-age children with hyperactivity disorder experience fewer symptoms [60]. Our results partly confirm the findings of a study in Iran [61], which reported that the quality of life of type 2 diabetic patients was improved by utilizing CAM. Additionally, some research has reported combining CAM techniques with traditional medical therapies. For example, according to Mofid et al., meditation practice lessens the weariness experienced by breast cancer patients receiving chemotherapy. As a result, in addition to medication, meditation is recommended for these individuals [5]. These findings concur with those of earlier studies on this subject [62, 63]. However, it is important to note that most of these applications are used by families without the knowledge of health personnel. While CAM techniques can have positive effects, they can also cause negative interactions [6]. Therefore, careful consideration is needed when choosing CAM



**Figure 1.** The preferred reporting items for systematic reviews and meta-analyses guidelines

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Notes: A compliant study selection procedure is shown in the flow diagram.

techniques for children, as parents often have high expectations for treatment, including symptom relief and full recovery from illnesses like cancer.

## Conclusion

This systematic review underscores the widespread use of CAM among Iranian children, with popular modalities including herbal remedies, massage therapy, acupuncture, and mind-body practices for managing



Table 1. Features the included studies

Authors (y)	Design	Aim (s)	Sample Size	Participant (s)	Setting	Type of CAM Used	Subject/Population	Results
Bahrololoomi et al. 2022 [19]	Randomized crossover clinical trial	To assess the impact of bubble blower breathing exercises on discomfort and anxiety during inferior alveolar nerve block	n=35	Age group 7 to 10 years	Pediatric dental clinic	Employing bubble blowers for breathing exercises as a diversion and relaxing technique	Inferior alveolar nerve block: Anxiety and pain	To effectively decrease pain and anxiety
Goodarzi et al. 2022 [31]	Parallel, randomized, blinded clinical study	To ascertain how body wash containing marshmallow plants affects a child's fever	n=92	Ranging from 6 months to 10 years	Pediatric ward	Body wash with white marshmallow extract	Tympanic temperature of more than 38.3 °C	Decreased children's fever, and the time it took for temperatures to return to normal was significantly 8 min shorter.
Dehghanpour et al. 2022 [32]	Double-blinded randomized clinical	To determine whether applying coconut oil to the enuresis will improve it	n=120	Aged 6 to 14 years	For eight weeks, parents at home recorded their children's daily urination patterns	One time each night, apply 6 drops of each coconut and paraffin oil topically to the suprapubic, sacrum, and flanks, respectively	Mono symptomatic nocturnal enuresis	Coconut oil used topically for four weeks can lessen enuresis.
Golsorkhi et al. 2022 [33]	Multi-center, randomized, double-blind, active product, and placebo-controlled clinical study	To assess the efficacy and safety of two herbal medicine products, <i>Rosa canina</i> L. and a polyherbal formulation syrup, on the clinical symptoms of ADHD in children and adolescents	n=90	Aged 5–14 years	Three pediatric psychiatry and neurology clinics	<i>Rosa canina</i> L., 5 mL every 8 h for 8 weeks, and a syrup made from a polyherbal formulation.	The management of comorbid conditions, hunger, and sleep in children and adolescents with ADHD	The authors postulated that RC and polyherbal formulation syrups would be useful for treating ADHD.
Mahyar et al. 2022 [34]	Randomized clinical trial	To research honey's impact on children's acute diarrhea	n=80	Aged 1 - 5 years	Qazvin Children Hospital	For five days, children aged 1-3 years received 1.5 mL of honey every six hours, while kids aged 3-5 years received 2 mL every six hours. Each time, it was diluted in 15 mL of water.	Acute diarrhea in children, length of vomiting and diarrhea, time to recover, and length of hospital stay	Reduces the duration of diarrhea, quickens the healing process, and cuts down on hospital stays.
Pouy et al. 2022 [24]	A placebo-controlled, single-blind, randomized trial study	To research how acupressure affects how much pain children experience after tonsillectomy	n=144	5 to 12 years old	the Amiralmomenin Hospital in the City of Rasht, Iran	Three acupoints were subjected to acupressure: ST-36, ST-44, and LI4 (Hego) (Zusanli)	Pain after tonsillectomy	After a tonsillectomy, the discomfort was effectively reduced with acupressure.
Miralizadeh et al. 2022 [27]	Randomized clinical trial	To contrast the effects of foot and palm reflexology on newborns receiving non-invasive ventilation who are experiencing respiratory distress	n=150	Infants	at Fatemieh Hospital in Hamadan City, Iran	Foot and palm reflexology massages lasted 10 min over three days and six rounds	Respiratory distress score, percentage of oxygen saturation, and respiratory rate	When premature newborns are given non-invasive ventilation, reflexology massage, particularly palm reflexology massage, helps to reduce respiratory distress.

Authors (y)	Design	Aim (s)	Sample Size	Participant (s)	Setting	Type of CAM Used	Subject/ Population	Results
Khaksarian et al. 2021 [35]	Clinical experiment that was double-blinded, randomized, and placebo-controlled	To assess the effectiveness and safety of saffron as a supplement to Ritalin for treating ADHD symptoms in adults	n=70	Aged between 6 and 16 years	Lorestan-affiliated Mehr Psychiatric Hospital	Depending on the body mass index, saffron capsules ( <i>Crocus sativus</i> ) should be taken at a dose of 20 to 30 mg/day (20 and 30 mg/day for weights under and over 30 kg, respectively).	ADHD	Saffron and methylphenidate together were found to be more successful in treating ADHD patients than either drug alone.
Jahandarpour & Sobhani 2022 [18]	Quasi-experimental method pre-test-post-test design	To assess how yoga-based mindfulness training affects depression and anxiety in young people with type 1 diabetes	n=20	10-17 years	At clinics in Shiraz City, Iran	Yoga for ten weeks, 45 min every week	Adolescents with type 1 diabetes who experience anxiety and depression	To improve depression and anxiety in type 1 diabetes adolescents
Moghadam et al. 2022 [25]	Clinical trial study	To assess the impact of infantile colic symptoms on Hugo point acupressure and belly massage	n=144	Infants	At home	Hugo point acupressure and belly massage are performed three times each evening	For four weeks, the amount of colicky sobbing and the amount of sleep each day were both documented.	Hugo point acupressure had a more significant effect on the alleviation of colic pain, as compared to abdominal massage and changing position.
Ghasemi et al. 2021 [36]	Randomized clinical trial	Hugo's point massage and the play's impact on hospitalized patients' intravenous-line placement pain intensity	n=72	Aged 3–6 years	in Besat Hospital in Sanandaj City, Iran	Three min before the insertion of the intravenous line began and throughout, the central angle between the first and second bones of the palm was massaged.	Hospitalized patients' intravenous-line insertion pain threshold	The play and Hugo's point massage were more effective at reducing the discomfort associated with placing intravenous lines in young children.
Zamanifard et al. 2022 [20]	Randomized controlled trial	To research how virtual-directed painting therapy affects children with diabetes' levels of anxiety, despair and self-efficacy.	n=40	Aged 8-12 years	Imam Reza Clinic of Diabetes in Shiraz City, Iran	WhatsApp-led virtual painting therapy (six 2-h group sessions once a week for six weeks)	Anxiety, depression and self-efficacy of children with type 1 diabetes	To help diabetic youngsters with their anxiety and despair, painting therapy should be taken into consideration as part of care plans in diabetes centers and other public places.
Ghasemi et al. 2022 [23]	A randomized controlled clinical trial with a cross-over design	To determine whether music and vapor coolant spray might help young thalassemia patients feel less discomfort during venous cannulation.	n=36	Aged 6-12 years	Thalassemia Center in Bam City, Iran	Before the annulment and the procedure, vaporcoolant spray was administered at a distance of 25 cm for 5 s while listening to music.	The pain of venous cannulation	The pain associated with venous cannulation could be reduced using vapor coolant. There was no pain relief by music for venous cannulation.
Gozin et al. 2022 [21]	Controlled clinical trial study	To evaluate how well the "tell-show-do" methodology and audio-visual storytelling compare in terms of easing children's dental anxiety.	n=45	Aged 6-9 years	Public health center in Shiraz City, Iran	The "tell-show-do" methodology combines audio-visual storytelling	Dental anxiety in children	The use of audio-visual storytelling to soothe children's dental anxiety is practical and beneficial.

Authors (y)	Design	Aim (s)	Sample Size	Participant (s)	Setting	Type of CAM Used	Subject/Population	Results
Fallah et al. 2022 [37]	Before-after, single-group, clinical trial	To assess how neuromuscular electrical stimulation affects the serum glucose level in young people with type 1 diabetes.	n=29	Aged 7-18 years	at Amirkola Children's Hospital in Babol City, Iran	Hamstrings and quadriceps underwent neuromuscular electrical stimulation in two 20-min phases throughout three treatments each week for eight weeks.	Fasting blood sugar levels in serum	A total of 8 weeks of Neuromuscular electrical stimulation had positive effects on the decrease in fasting blood sugar and total daily insulin dose.
Tavassoli et al. 2021 [38]	Randomized, active-controlled, single-center trial	To determine whether viola flower syrup is more effective than polyethylene glycol in treating functional constipation in children.	n=140	Aged 4-10 years	Bahrami Pediatric Hospital	Polyethylene glycol solution 40% (1 g/kg/day) or viola flower syrup (5 mL three times/day) administered orally	Functional constipation	According to research, viola flower syrup can be used to treat pediatric functional constipation and is a relatively safe and effective drug.
Mostajeran et al. 2020 [39]	Controlled clinical trial	To determine whether ma'aljobon is effective in treating ADHD	n=64	Aged 9-11 years	Khorshid Hospital of Isfahan's (Iran) outpatient clinic for children and adolescents	Ma'aljobon, a type of whey protein generated from milk during the cheese-making process, is a well-known nutritional supplement claimed to boost immunity and prevent neuropsychiatric disorders. ma'aljobon 25 g in 100 mL water, once daily after breakfast	Children with ADHD	Ma'aljobon may be used in conjunction with other treatments to help children with ADHD control their hyperactivity, focus and attention spans.
Saroukolayi & Karahroudy, 2020 [28]	Controlled clinical trial	The effects of foot reflexology massage on chemotherapy-induced gastrointestinal symptoms in cancer-stricken youngsters	n=60	School-aged	Bahrami Pediatric Hospital	A total of 30 min before treatment and for up to five days	Cancer patients	The intervention group's nausea and vomiting levels considerably decreased following a reflexology treatment.
Ghanbari et al. 2021 [22]	Randomized clinical trial	The impact of music therapy on children diagnosed with leukemia's pain and anxiety during lumbar puncture and bone marrow aspiration procedures	n=50	Children	Children's Hospital of Kerman-shah City, Iran	Used headphones to listen to children's music both before and during invasive treatments.	Children with leukemia who undergo lumbar puncture and bone marrow aspiration procedures	Children with leukemia and other patients are advised to use music therapy as a non-invasive, simple, affordable, and efficient technique for easing their pain and anxiety.
Ghaljaei & Jalalodini, 2021 [29]	Clinical trial study	To look at how foot reflexology affects the physiological reactions that intrathecal chemotherapy drug injection in children with leukemia causes for discomfort	n=80	Aged 6-12 years	The hematology ward of a teaching hospital in Zahedan City, Iran	foot reflexology for 20 minutes (10 min each foot)	physical indications (such as blood pressure and heart rate) and pain	Because of foot reflexology's good impact on the reduction of pain and physiological markers, it can be utilized in conjunction with traditional therapies.



Authors (y)	Design	Aim (s)	Sample Size	Participant (s)	Setting	Type of CAM Used	Subject/Population	Results
Daneshfard et al. 2020 [40]	Randomized triple-blind placebo-controlled clinical trial	To assess chamomile's effectiveness in treating neutropenia	n=40	Aged 2–18 years	Shiraz Amir Oncology Hospital	Got either 2.5 mL of the medication (containing 125 mg of chamomile extract) or a placebo every day, syrup for the period of 30 days	Absolute neutrophil count white blood cell and quality of life	By reducing the side effects of chemotherapy, such as neutropenia, chamomile syrup can be used as an additional treatment for leukemia in children.
Ranjbar et al. 2020 [41]	Randomized controlled trial	To assess how topical lettuce seed oil affects sleep disturbances	n=67	Aged 3–6 years	Pediatric psychiatry clinics of Isfahan City, Iran	Applying seven drops of lettuce seed oil topically to children's foreheads and temporal regions for three weeks	Problems of sleep such as difficulty falling asleep, difficulty staying asleep, daytime tiredness, irregular sleep patterns, snoring, and insomnia	Children's forehead and temporal areas could be treated topically with lettuce seed oil as a safe and efficient sleep disorder treatment.
Asadi et al. 2020 [30]	Randomized controlled trial	To look at how a mother's foot massage affects how severe is a child's ADHD symptoms	n=56	Aged 6–12 years	Psychiatric clinics affiliated to Isfahan	12 massage sessions, in total 10 min each were given to the youngster 1 h before bedtime. The massage used sweet almond oil.	Severity of ADHD	Together with medication programs, massage therapy is a low-cost, accessible kind of treatment that can help with some ADHD symptoms. Additionally, massage therapy can enhance these kids' concentration and memory.
Paknejad et al. 2021 [42]	Double-blind study	To assess the effectiveness of a syrup prepared from the fruit of <i>Myrtus communis</i> L. in treating gastric reflux illness in children.	n=30	Aged 1–7 years	At home	Syrup prepared from the fruit of <i>M. communis</i> L.	Gastroesophageal reflux disease	After 8 weeks, the "refusal to eat" symptom in the intervention group was lower than in the placebo group. Therefore, myrtle fruit syrup might be an option for kids who have a poor appetite.
Rahmani et al. 2022 [43]	Randomized parallel-group clinical trial	To research the effects of a diet that adheres to Western medical concepts and PM recommendations.	n=20	Aged 2–12 years	the Pediatric Nephrology Clinic of Mofid Hospital Tehran	Whole grains, pomegranates ( <i>Cydonia oblonga</i> mill.), quinces ( <i>C. oblonga</i> mill.), and quince juice are all used in Persian medicine (wheat and barley); a 24-h diet	Kidney disease syndrome anthropometric and biochemical markers such as total cholesterol, triglycerides, albumin, urea, creatinine and spot urine protein proteinuria	Although the improvements were not significant when compared to the control group, total cholesterol and creatinine levels dramatically decreased in the intervention group. The main Western medical diet regulations were supplemented with Persian medical-dietary advice to reduce proteinuria and strengthen the fight against nephrotic syndrome.

Authors (y)	Design	Aim (s)	Sam-ple Size	Partici-pant (s)	Setting	Type of CAM Used	Subject/Population	Results
Binesh et al. 2020 [26]	Random-ized con-trolled trial	To assess the efficacy of auricular treatment in treating attention deficit hyperactivity disorder in comparison to sham surgery (ADHD)	n=50	aged 6-14 years	Welfare Centers of Tehran City, Iran	A sham procedure or auricular therapy in acupuncture locations once every week for six weeks.	Children with ADHD	When compared to patients who got sham acupuncture sites, those who received auricular therapy at acupuncture points experienced a statistically significantly larger reduction in ADHD symptoms.

CAM: Complementary and alternative medicine; ADHD: Attention deficit hyperactivity disorder.

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pain, anxiety, and conditions like ADHD. The strong cultural preference for herbal treatments highlights their perceived safety and effectiveness, though unmonitored use raises concerns about interactions with conventional treatments. Future research should focus on CAM’s safety and efficacy in pediatric care, establish guidelines for its integration into clinical practice, and explore the sociocultural factors influencing CAM use to better understand family preferences.

Study limitations

This study had several limitations. First, access to full articles was sometimes restricted by subscription-based journals, making it challenging to include certain studies in the analysis. Where possible, open-access articles and institutional library resources were used to gather comprehensive data. Additionally, the study was limited by inclusion criteria, heterogeneity of data, and a specific focus on research conducted within Iran, which may affect the generalizability of the findings to other cultural or geographic settings. Furthermore, inadequate reporting of conditions and outcomes in some of the included studies reduced their applicability to real-world settings, limiting the strength of our overall conclusions.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Authors contributions

All authors equally contributed to preparing this article.

Conflicts of interest

The authors declared no conflict of interest.

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