






Application and effectiveness of Auriculotherapy in the context of child health: an integrative literature review

Aplicação e efetividade de Auriculoterapia no contexto da saúde da criança: revisão integrativa da literatura

Aplicación y eficacia de la auriculoterapia en el contexto de la salud infantil: una revisión bibliográfica integradora

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ABSTRACT

Objectives: to analyze the application of auriculotherapy in the health context of children (zero to 12 incomplete years) and the scientific evidence of its effectiveness in relation to the proposed therapeutic purposes. **Methods:** integrative literature review, carried out in November 2023, in the databases and virtual library MEDLINE/PubMed, Scopus, Biblioteca Virtual em Saúde/BIREME, COCHRANE Library, and Scientific Electronic Library Online, using the controlled descriptor “Auriculotherapy” and the uncontrolled descriptor “Children”, with no time restriction on publication. For analysis, we used the reference of evidence accuracy. **Results:** ten articles were selected from Cuba (n=4), Taiwan (n=3), China (n=2), and Iran (n=1), which were published in the last 15 years and predominantly dealt with school-age children. Those with strong evidence are related to the themes: treatment of onychophagia, myopia, and attention deficit hyperactivity disorder (ADHD). The auricular points with the highest recurrence of use were: Shenmen, heart, and eye. **Conclusion:** this therapy has been shown to be effective as an adjunct for the treatment of onychophagia, ADHD, and myopia in the school-age pediatric population, and for the other therapeutic purposes identified in the review, despite the promising results, further research is needed to affirm its effectiveness.

Descriptors: Auriculotherapy; Child Health; Medicine, Chinese Traditional; Complementary Therapies; Pediatric Nursing.

RESUMO

Objetivos: analisar a aplicação da auriculoterapia no contexto de saúde de crianças (zero a 12 anos incompletos) e as evidências científicas da sua efetividade em relação às finalidades terapêuticas propostas. **Métodos:** revisão integrativa da literatura, realizada em novembro de 2023, nas bases de dados e biblioteca virtual MEDLINE/PubMed, Scopus, Biblioteca Virtual em Saúde/BIREME, COCHRANE Library e Scientific Electronic Library Online, utilizando o descritor controlado “Auriculoterapia” e o descritor não controlado “Children”, sem restrição temporal de publicação. Para análise utilizou-se o referencial de acurácia de evidências. **Resultados:** foram selecionados dez artigos oriundos de Cuba (n=4), Taiwan (n=3), China (n=2) e Iran (n=1). Eles foram publicados nos últimos 15 anos e abordavam predominantemente crianças em idade escolar. Aqueles com evidência forte relacionam-se às temáticas: tratamento de onicofagia, miopia e transtorno de déficit de atenção e hiperatividade (TDAH). Os pontos auriculares de maior recorrência de uso foram: Shenmen, coração e olho. **Conclusão:** essa terapia mostra-se efetiva como coadjuvante para tratamento de onicofagia, TDAH e miopia na população pediátrica em idade escolar, e para as

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demais finalidades terapêuticas identificadas na revisão, apesar dos resultados promissores, é preciso desenvolver mais pesquisas para que se possa afirmar sua efetividade.

Descritores: Auriculoterapia; Saúde da Criança; Medicina Tradicional Chinesa; Terapias Complementares; Enfermagem Pediátrica.

RESUMEN

Objetivos: analizar la aplicación de la auriculoterapia en el contexto de la salud de los niños (cero a 12 años incompletos) y la evidencia científica de su eficacia en relación con los fines terapéuticos propuestos. **Métodos:** revisión integrativa de la literatura, realizada en noviembre de 2023, en las bases de datos MEDLINE/PubMed, Scopus, Biblioteca Virtual em Saúde/BIREME, Biblioteca COCHRANE y Scientific Electronic Library Online y biblioteca virtual, utilizando el descriptor controlado “Auriculoterapia” y el descriptor no controlado “Niños”, sin restricción de tiempo de publicación. Para analizarlo, utilizamos el parámetro de precisión de las pruebas. **Resultados:** se seleccionaron diez artículos de Cuba (n=4), Taiwán (n=3), China (n=2) e Irán (n=1), que se publicaron en los últimos 15 años y trataban predominantemente de niños en edad escolar. Los que presentan pruebas sólidas están relacionados con los temas: tratamiento de la onicofagia, la miopía y el trastorno por déficit de atención con hiperactividad (TDAH). Los puntos auriculares más utilizados fueron: Shenmen, corazón y ojo. **Conclusión:** esta terapia está demostrando ser eficaz como complemento para el tratamiento de la onicofagia, el TDAH y la miopía en la población pediátrica en edad escolar, y para los otros fines terapéuticos identificados en la revisión, a pesar de los resultados prometedores, se necesitan más investigaciones para afirmar su eficacia.

Descritores: Auriculoterapia; Salud Infantil; Medicina Tradicional China; Terapias Complementarias; Enfermería Pediátrica.

INTRODUCTION

Traditional Medicine encompasses, in addition to other medicines, Traditional Chinese Medicine, whose applications cover the physical, mental, and spiritual context of the individual⁽¹⁾. Traditional Chinese Medicine is in line with the laws of nature and is anchored in the Yin-Yang theory, which defends the existence of two forces that interrelate and provide balance; it also includes concepts of energy (Qi) and the connection with the elements of wood, fire, earth, metal, and water⁽²⁾.

Its approach is aimed at establishing a bond, preventing problems, recovering health, and encouraging self-care⁽²⁾. Among its therapeutic modalities is auriculotherapy, which is recognized as safe as long as it is implemented correctly by a duly qualified professional⁽³⁾. This therapy is recognized and recommended in Brazil by the National Policy for Integrative and Complementary Practices in the Unified Health System (SUS)⁽²⁾.

In this technique, the pinna is understood as a body microsystem, innervated and containing motor and sensory parts, which can be stimulated by manual pressure, electrical stimulation, seeds, needles, lasers, and moxibustion, among others⁽⁴⁾.

Its therapeutic effects have mostly been studied in adult populations in situations involving anxiety, pain in labor, pain syndromes, cancer, sleep, and quality of life, among others^(3,5-9).

In the pediatric population, studies aimed at testing protocols and analyzing their therapeutic effectiveness are still scarce. It is therefore necessary to know the state of the art in the case of children.

Based on the above, the objective is to analyze the application of auriculotherapy in the health context of children (zero to 12 incomplete years) and the scientific evidence of its effectiveness concerning the proposed therapeutic purposes.

METHODS

This is an integrative literature review⁽¹⁰⁾ with an evidence-based approach.

The research question was based on the PICO strategy (Patient/Population, Intervention, Control, and Outcome)⁽¹¹⁾: What are the applications of auriculotherapy in the context of children's health, and the scientific evidence on its effectiveness in relation to the proposed therapeutic purposes?

Searches were carried out in the following databases and virtual libraries: Medical Literature Analysis and Retrieval System Online (MEDLINE) of the National Library of Medicine of the United States of America using the PubMed search engine, Scopus, Virtual Health Library/Latin American and Caribbean Center on Health Sciences Information (BVS/BIREME), COCHRANE Library, Scientific Electronic Library Online (SciELO).

The bibliographic survey took place in November 2023, using the controlled descriptor “Auriculotherapy”, searched in the Medical Subject Headings (MeSH), and the non-controlled descriptor “Children”, chosen to replace the term “Child” because it resulted in a greater number of publications found in two of the five search bases. The Boolean operator AND was used between the descriptors.

The review included original articles or meta-analyses available in full, online, and free of charge, with no time or language limits, and covering the application of auriculotherapy in children (0 to 12 incomplete years). Publications of the case study/series type that used different application protocols between participants and those whose objectives did not answer the review question of this research were excluded. Although it is not mandatory for integrative reviews, to better understand the process of searching and selecting references, the report was prepared based on the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR)⁽¹²⁾.

The eligible articles were entered into an Excel spreadsheet (version 16.0.4266.1003, 2016, Microsoft Corporation, United States), containing the following variables: author, title, year of publication, journal, country of origin, type of study, population, intervention objective, control group, number of participants, description of the technique, study outcome and side effects.

Finally, the studies were categorized and assessed by evidence analysis, using the evidence accuracy framework according to Melnyk (2005)⁽¹³⁾, which classifies evidence into seven levels, namely: level 1 (strong), systematic reviews or meta-analyses, which were de-

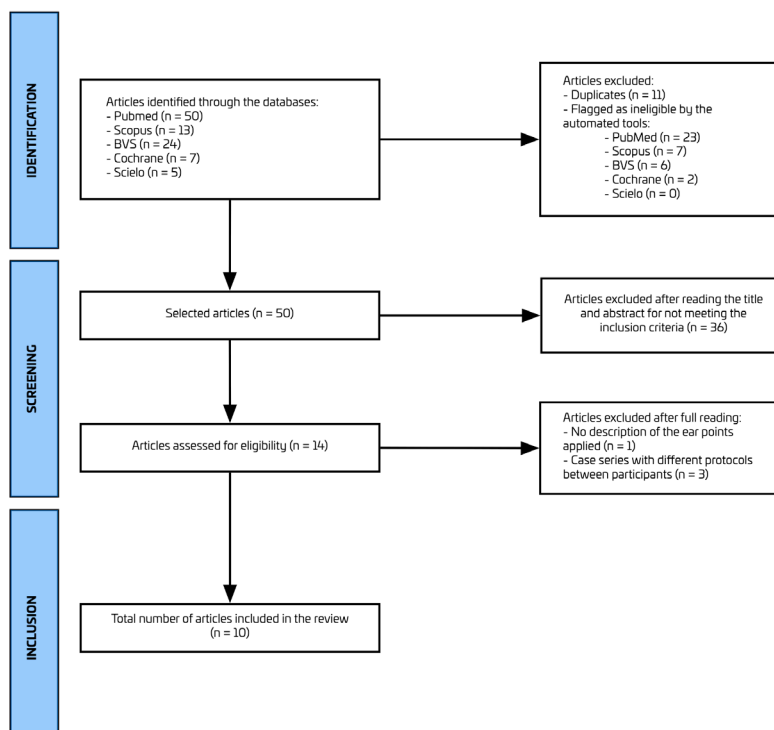
veloped from randomized controlled clinical trials, as well as clinical guidelines based on systematic reviews of randomized controlled clinical trials; level 2 (strong), well-designed randomized controlled clinical trial; level 3 (moderate), well-designed clinical trials; level 4 (moderate), well-designed cohort and case-control studies; level 5 (moderate), systematic reviews with descriptive and qualitative methodological design; level 6 (weak), single descriptive or qualitative studies; and level 7 (weak), opinion of authorities and/or report of expert committees. When a clinical trial had weaknesses in its design or very small samples, it was classified similarly to a descriptive study, with an evidence accuracy level of 6 (weak). For health decision-making purposes, the quality of evidence and strength of recommendation is considered to be a strong level of evidence \geq II⁽¹⁴⁾.

A synthesis was drawn up, considering the best evidence to guide the practice of auriculotherapy in pediatric settings (sixth stage of the review study). The results were interpreted and discussed based on the literature in the field.

RESULTS

A total of 99 publications were identified, of which 11 were duplicates (Figure 1). Ten studies met the inclusion criteria. Among the outcomes studied, three sought

Figure 1 - Flowchart of the selection of identified studies, 2023



Note: Prepared according to the model recommended by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR)⁽¹²⁾

to evaluate the effect of auriculotherapy in the treatment of myopia⁽¹⁵⁻¹⁷⁾, three tested the effect in the treatment of onychophagia or other habits that contribute to deformity of the oral cavity⁽¹⁸⁻²⁰⁾, and the other outcomes investigated were attention deficit hyperactivity disorder - ADHD⁽²¹⁾, nausea, and vomiting in the context of chemotherapy⁽²²⁾, stuttering⁽²³⁾, obesity⁽²⁴⁾. Five studies presented level 2 (strong) evidence^(15-18,21), and the others had level 6 (weak)^(19,20,22-24) (Table 1).

As for the country of origin, four came from Cuba^(19,20,23,24), followed by three from Taiwan^(16,17,22), two from China^(15,18), and one from Iran⁽²¹⁾. Seven were published in journals in the field of complementary therapies^(15-18,20-22) and three in the field of medicine^(19,23,24). Regarding the year of publication, two articles were published in 2020^(20,21), four were published between 2015 and 2019^(15,18,19,23), three between 2012 and 2014^(16,22,24), and one in 2008⁽¹⁷⁾.

The most prevalent age group in the studies was school-age children. The effectiveness of auriculotherapy, highlighted by a strong level of evidence (\geq to II)⁽¹⁴⁾, was related to myopia^(15,16), nail biting⁽¹⁸⁾, and attention deficit hyperactivity disorder⁽²¹⁾.

Regarding side effects, three articles^(16,17,22) reported itching, painful sensations, or sensitivity at the auricular

stimulation points. Other side effects reported include burning at the site and slight swelling, but without specifying the number of participants⁽¹⁸⁾.

Concerning the most recurrent auricular points in the articles with a strong level of evidence^(15-18,21), the “Shenmen” point was used in five of the articles analyzed, followed by the “heart” point, which was not used only for the ADHD protocol, and the “eye” point, cited three times, due to the occurrence of three publications referring to myopia. Furthermore, the “kidney”, “liver”, “spleen”, “vision 1”, and “vision 2” acupoints each appeared in two of the five articles in question.

A synthesis of these points and their therapeutic purpose is shown in Figure 2.

Studies that tested or created hypotheses for the treatment of deforming oral habits^(16,18), the improvement of nausea and vomiting in children undergoing chemotherapy⁽²²⁾, the treatment of stuttering⁽²³⁾, or obesity⁽²⁴⁾ were configured with a lower level of evidence, due to their quasi-experimental design or small samples, but it is worth noting that all of them showed at least one outcome with a positive result in groups treated with auriculotherapy.

Table 1 - Characterization of articles according to design, level of evidence, population characteristics, intervention, control group, and outcome, 2023

Continue...

Study code / Type of study / LE	Study location and population characteristics	Intervention	Control	Outcome and results
E1 ⁽¹⁵⁾ / Randomized, double-blind study. Level 2 (strong)	- Location: China - n = 72, - Age = 8 to 9 years old; - Myopia diagnosis.	- (EG = 39) - Seed allocation at points: CO10 (kidney), LO5 (eye), TF4 (Shenmen), CO15 (heart), CO12 (liver) and CO13 (spleen), bilaterally. - Duration = 3 months	- (CG = 33) - Examination of visual function without auricular stimulation with seeds.	- Myopia - Significant improvement in binocular vision with the naked eye in the EG after the intervention compared to the CG ($p < 0.05$)
E2 ⁽¹⁶⁾ / Single-blind randomized controlled clinical trial. Level 2 (strong)	- Location: Taiwan - n = 110; - age = 6 to 12 years old; - diagnosis of myopia with a spherical equivalent of -0.5 diopter or less.	- (EG = 54) - Topical eye drops of 0.125% atropine associated with stimulation at five auricular acupoints (Shenmen, heart, eye, vision 1, and vision 2) using a 1 mm alloy ball, with weekly changes of laterality of the points.	- (CG=56) - Topical atropine eye drops 0.125%, 1 drop, every night	- Myopia - The EG had less myopia progression and axial length elongation compared to the CG ($p < 0.0001$). - Anterior chamber depth increased more in the EG than in the CG ($p = 0.0004$). Intraocular pressure decreased more in the EG than in the CG ($p = 0.007$). A 1 mmHg decrease in intraocular pressure correlated with a decrease in myopia progression ($p = 0.006$).

Table 1 - Characterization of articles according to design, level of evidence, population characteristics, intervention, control group, and outcome, 2023

Continuation...

Study code / Type of study LE	Study location and population characteristics	Intervention	Control	Outcome and results
E3 ⁽¹⁷⁾ / Single-blind randomized controlled trial. Level 2 (strong)	- Location: Taiwan - n = 71; - age = 6 to 15 years old; - diagnosis of myopia, in the first visual acuity evaluation, spherical equivalent greater than -0.5, and after cycloplegic use they had astigmatism and anisometry less than 2.0 and intraocular pressure less than 21mmHg.	- EG (0.25A+E) - 0.25% atropine eye drops and auricular stimulation with 1 mm alloy balls for stimulation. - The auricular acupoints were divided into three groups: 1st - Yan (Eye), Gan (Liver), Shenmen (Spirit Gate); 2nd - Mu1 (Vision 1), Pi (Spleen), Xin (Heart); 3rd - Mu2 (Vision 2), Shen (Kidney), Pizhixia (Subcortex). - The sequence followed in the three groups was changed monthly in the same order and laterality was changed weekly.	- CG 0.25A (n=22) Atropine eye drops 0.25% every night. - CG 0.5A (n=23) Atropine eye drops 0.5% every night. - Duration = minimum 6 months.	- Myopia - There was no significant difference in the mean progression of myopia between CG 0.5A and EG (0.25A+E). The effect of combined therapy was similar to that of atropine 0.5% alone. However, there was markedly reduced myopia progression in the EG (0.25A+E) compared to the CG 0.25A group ($p < 0.05$). There was no significant difference in the axial length of the eye between the groups.
E4 ⁽¹⁸⁾ / Pragmatic, cross-over, randomized study. Level 2 (strong)	- Location: China - n = 83; - age = 8 to 12 years; - enrolled in elementary school; - have bitten their nails for at least 8 weeks, at least 5 times a day; - experience of social harm.	- (EG = 42) - Treatment for habit reversal associated with intervention: application of magnetic seeds on five points: sympathetic, sanjiao, heart, Shenmen, and adrenal gland. - The seeds were changed every seven days. - Duration = 1 month - Note: After two months, the groups were crossed over.	- (PG = 41). - Habit reversal treatment, associated with placebo auriculotherapy on the points: heel, ankle, knee, hip, and buttocks.	- Nail biting habit - Greater treatment effectiveness in the EG, in relation to habit reversal, anxiety score, nail growth status, and simplified gingival index ($p < 0.001$).
E5 ⁽¹⁹⁾ / Prospective, longitudinal, and descriptive research. Level 6 (weak)	- Location: Cuba - n=96; - age = 4 to 13 years old; - deforming oral habits, no systemic diseases.	- EG (n = 96) - Application of seeds to the auricular pavilion on the points: Shenmen, anxiolytic, heart, and brain. - Duration = cycles of four to six weeks.	No control group	- Deforming oral habits - Concerning digital sucking - 78.9% eliminated the habit. Onychophagia - decreased by 7.8%. - A small relationship was found between efficacy and the type of habit ($p < 0.05$).
E6 ⁽²⁰⁾ / Quasi-experimental longitudinal prospective study (descriptive analysis) Level 6 (weak)	- Location: Cuba - n=63 - age = 7 to 13 years old; - deforming oral habits such as digital sucking, onychophagy, and cheilophagy.	- (EG1=32; EG2=31) - EG1 – application of seeds on points: Heart 1, Heart 2, Shenmen, anxiolytic, and brain; replaced every seven days. - EG2 - Bach Flower remedies. - Monthly evaluation Duration = three months	No control group	- Deforming oral habits - In EG1, onychophagy and cheilophagy were eliminated and 6.3% maintained the digital sucking habit. - In EG2, 12.9% and 6.5%, respectively, persisted in digital sucking and onychophagy.
E7 ⁽²¹⁾ / Simulation-controlled randomized trial. Level 2 (strong)	- Location: Iran - n=50 - age = 6 to 14 years old; - diagnosis of attention deficit hyperactivity disorder - ADHD; - no change in medication dosage or ADHD symptoms (last two weeks).	- (EG = 25) - Bilateral electrostimulation via transcutaneous electrodes with a frequency of 10Hz, once a week, of the following acupoints: Shenmen, point zero, hippocampus, prefrontal cortex, master oscillation, and laterality control point. - Duration = six weeks.	- (CG= 25) - Applying adhesive tapes to non-acupuncture points, and replacing the adhesive once a week.	- Attention deficit hyperactivity disorder - The scores for attention deficit disorder decreased in the EG ($p = 0.006$), while there was no significant change in the CG ($p = 0.55$). In addition, there was a change in the scores for Hyperactivity in the EG ($p = 0.001$), while in the CG it was not significant ($p = 0.74$).

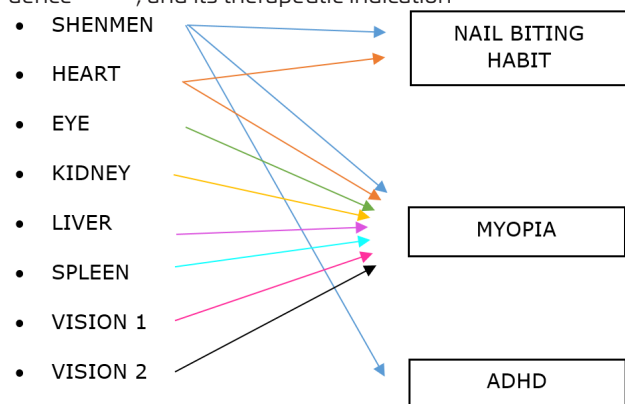
Table 1 - Characterization of articles according to design, level of evidence, population characteristics, intervention, control group, and outcome, 2023

Conclusion.

Study code / Type of study / LE	Study location and population characteristics	Intervention	Control	Outcome and results
E8 ⁽²²⁾ / Randomized crossover feasibility study. Level 6 (weak)	- Location: Taiwan - n = 10 - Age = 5 to 18 years old; - diagnosis of cancer - use of chemotherapy (at least one round) and chemotherapeutic drugs with high or moderate hematogenic potential; - use of standard antiemetics; - no previous auriculotherapy (last 3 months).	- In the first round of chemotherapy, standard care. From the second round, divided into experimental and placebo groups and in the third round, the groups were crossed over. - EG (n = 10) - The auricular points bilaterally were: Shenmen, sympathetic, cardia, stomach, and digestive subcortex. - Duration = one week.	- (PG = 10) - Treatment with acupressure on the auricular points (Sham): external knee, vision, shoulder joint, and eye.	- Nausea and vomiting - EG - lower occurrence and severity of nausea and vomiting than PG (p < 0.05).
E9 ⁽²³⁾ / Longitudinal and prospective experimental study. Level 6 (weak)	- Location: Cuba - n = 14 - age = 6 to 13 years old; - diagnosis of stuttering regardless of the stage and its clinical forms,	- (EG = 7) - Usual treatment for stuttering (relaxation techniques, expiratory technique, inflexive techniques, and chewing with natural sound) and auriculotherapy with seeds on the points: heart 1, heart 2, larynx, Shenmen and anxiolytic; replacing seeds every seven days. - Duration = 30 days	-(CG = 7) - Standard treatment (relaxation techniques, expiratory technique, inflexive techniques, and chewing with natural sound). - All were applied from Monday to Friday, once a day. - During the rest of the day and at weekends, they carried out the techniques at home with the help of family members.	- Stuttering and symptoms related to its clinical forms. - In the EG, the symptoms and signs decreased during treatment, except for awareness of their difficulties (which remained at 100%) and oral tension, although this was evident in only 28.6% of them. Among those that decreased the most were enuresis and anxiety.
E10 ⁽²⁴⁾ / Quasi-experimental (intervention) study). Level 6 (weak)	- Location Cuba - n=100 - age = 5 and 18 years old; - diagnosis of obesity according to Cuban standards; - referral for traditional and natural medicine consultation after evaluation with endocrinologist.	- (EG = 50) - Dietary treatment, and exercise, associated with auriculotherapy with seeds applied to the points: hunger, Shenmen, anxiolytic, and stomach, with pressure being requested before meals. After a week, the seeds were placed in the other ear. The number of sessions applied depended on the patient's therapeutic response, based on a weekly assessment.	-(CG = 50) - Dietary treatment (evaluated quarterly or according to the needs of each case) and physical exercise, with weekly evaluation.	- Obesity - A good or regular response to treatment with less than 10 sessions was observed in the EG in 94% of the children, while in the CG this occurred in 78% (p = 0.02) - There was no difference in weight reduction between the groups (p = 0.24).

Note: Level of evidence (LE); Experimental group (EG); Control group (CG); Placebo group (PG).

Figure 2 - Correspondence between the auricular points most commonly used in articles with a strong level of evidence^(15-18, 21), and its therapeutic indication



DISCUSSION

Auriculotherapy in children has been researched for its effectiveness in treating or slowing down the progression of myopia⁽¹⁵⁻¹⁷⁾, deforming oral habits, which include digital sucking, onychophagy, and cheilophagy⁽¹⁸⁻²⁰⁾, relieving nausea and vomiting during chemotherapy⁽²²⁾, treating stuttering⁽²³⁾, obesity⁽²⁴⁾, and ADHD⁽²¹⁾.

In each study, the intervention protocol is different, which is justified by the nature of this Traditional Chinese Medicine practice that takes into account the singularities of the people it treats, but which, in seeking to produce evidence of its effectiveness, has been trying to develop increasingly robust clinical studies³ and testing specific protocols that can be standardized⁽²⁵⁾.

Myopia is an outcome of great interest in research into the effectiveness of auriculotherapy and has been the subject of a meta-analysis⁽²⁶⁾ and a systematic review⁽²⁷⁾. The meta-analysis involved 12 studies on the control of myopia using auricular acupuncture and identified a low risk of bias in the studies and the effectiveness of auricular stimulation for this purpose⁽²⁶⁾. The systematic review on auricular stimulation to treat myopia in children and adolescents included ten randomized controlled studies and indicated that there is evidence of its efficacy, but warns that the results should be viewed with caution due to the lack of long-term follow-up after the stimulation is stopped⁽²⁷⁾.

In the present review, the effectiveness of auriculotherapy in improving myopia was demonstrated in two studies with a strong level of evidence^(15,16) and with results of no difference comparing the experimental and control groups in one study⁽¹⁷⁾. In each study, a different protocol was used, but with one element in common: in the studies in which the effectiveness of auriculotherapy for the treatment of myopia was verified^(15,16), the stimulation points were the same throughout the treatment, with only the laterality changing. However, in the study that showed no difference in effect, a protocol was used with weekly variations in the set of stimulated points⁽¹⁷⁾.

Auriculotherapy has been used to treat myopia in children as an adjuvant, associated with different formulations of atropine eye drops. A randomized controlled study analyzed the effect of 0.01% atropine eye drops compared to 0.01% atropine eye drops associated with auricular acupuncture in 104 patients aged between 7 and 12 years. In the group that used the combination of eye drops and auriculotherapy, the progression of myopia was delayed, although there was no effect on axial elongation and choroidal thickness⁽²⁸⁾.

As for the effectiveness of ADHD therapy, a reduction in both attention deficit and hyperactivity scores⁽²¹⁾ was found in a level 2 (strong) study. In turn, a study on the effect of systemic acupuncture and auriculotherapy with silicon tablets and crystals on children with symptoms of inattention and hyperactivity also found an increase in attention, and a decrease in impulses and agitation⁽²⁹⁾.

For this therapeutic purpose, there is promising evidence of the effectiveness of auriculotherapy, although the same cannot be said for acupuncture. A study involving systematic reviews and meta-analyses on the use of systemic acupuncture in children for the treatment of ADHD pointed out the risk of bias, the scarcity of publications, and the need for good-quality randomized clinical trials with larger samples⁽³⁰⁾.

Concerning nail-biting, the results of auriculotherapy have been positive in terms of nail growth, improvement in the gingival index, and reversal of the habit, as well as being associated with a significant reduction in anxiety levels, a factor which often leads to the habit⁽¹⁵⁾. When onychophagia is studied as an outcome along with other behaviors that can lead to deformities of the oral cavity, the positive effects of auriculotherapy are also seen^(19,20).

From this perspective, auriculotherapy has been extensively studied in the adult population, and just as in children, as shown in this review, it can be an adjunct in the treatment of anxiety disorders, although its efficacy and safety still require further methodologically more robust research⁽³¹⁾.

During chemotherapy, some symptoms generate great discomfort and so there is an interest in trying to minimize them, especially nausea and vomiting, through auriculotherapy. In the present review, the use of auriculotherapy reduced the intensity of these occurrences⁽²²⁾, although it did not reduce the number of episodes.

There is no consensus on a universal protocol for this purpose, but a search for a standardized protocol that can be judged effective is underway for the adult population of women with breast cancer who have experienced nausea and vomiting as a result of chemotherapy, based on evidence from systematic reviews, theories, and standards concerning auricular therapy⁽³²⁾.

Regarding the auricular points addressed in the studies included in this review, they are located extremely close to each other, and, for the treatment to be effective, they must be stimulated with maximum accuracy, implying that the professional has a precise auricular map⁽³³⁾.

Concerning the adverse events caused by auriculotherapy, a systematic review that included 43 articles pointed out that the majority can be characterized as transient, mild, and tolerable, however, they warn that the therapy should be applied by a qualified professional and patients need to receive the appropriate guidance, including not applying excessive pressure to the auricular acupoint⁽³⁴⁾.

Despite presenting a synthesis that can contribute to a better understanding of the potential of auriculotherapy and the knowledge gaps in the use of auriculotherapy in the context of children's health, it is necessary to point out that this review was limited by the inclusion of articles only available online, free of charge, in English and Spanish, resulting in the absence of articles published in the native language of the Eastern countries that were precursors of traditional and complementary/alternative medicine, in which auriculotherapy occurs

on a larger scale in the area of health, when compared to Western countries.

CONCLUSION

The evidence shows that auriculotherapy can be a coadjuvant strategy for the treatment of myopia, onychophagia, and ADHD. The adverse events described are mild and transient, including itching and burning or stinging at the site and slight swelling, and can therefore be considered a safe therapy.

Positive results have been observed in the use of auriculotherapy to treat nausea and vomiting in children undergoing chemotherapy and stuttering. However, the designs represent lower levels of evidence, and it is necessary to develop studies with rigorous methodological designs to validate the applicability, effectiveness, and safety of the therapy in the pediatric population.

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Conflict of interests

None.

Author contributions - Credit

ACR: conceptualization; data curation; formal analysis; methodology; project administration; writing – original draft; and writing - review & editing.

LBJ: conceptualization; data curation; formal analysis; methodology; project administration; supervision; validation; visualization; writing – original draft; and writing - review & editing.

NSS: validation; writing – original draft; and writing - review & editing.

POB: validation; writing – original draft; and writing - review & editing.

AF: validation; writing – original draft; and writing - review & editing.

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