

Effects of auriculotherapy in the treatment of nausea and vomiting: a systematic review

Efeitos da auriculoterapia no tratamento de náuseas e vômitos: revisão sistemática
Efectos de la auriculoterapia en el tratamiento de las náuseas y los vómitos: una revisión sistemática

Nathaly Bianka Moraes Fróes¹

ORCID: 0000-0002-1793-9829

Francisca Ariane de Souza Arrais¹

ORCID: 0000-0001-6905-8428

Priscila de Souza Aquino¹

ORCID: 0000-0003-4976-9817

Juliana Cunha Maia¹

ORCID: 0000-0002-1982-0186

Marianne Maia Dutra Balsells¹

ORCID: 0000-0002-9822-4242

¹Universidade Federal do Ceará. Fortaleza, Ceará, Brazil.

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Corresponding author:

Nathaly Bianka Moraes Fróes
E-mail: nathaly.bmf@hotmail.com

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ASSOCIATE EDITOR: Hugo Fernandes

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ABSTRACT

Objectives: to identify the effectiveness of auriculotherapy in the treatment of nausea and vomiting through a systematic review of the scientific literature. **Methods:** it was performed a systematic review of the literature making use of the following data basis: The Scopus, PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Web of Science, LILACS and Cochrane databases were used. Articles from complete research from randomized controlled clinical trials that describe using auriculotherapy in nausea and vomiting treatment were selected, without restriction of date or language. **Results:** eleven articles were selected for analysis. The majority approached the population in surgical situations, followed by patients undergoing chemotherapy and pregnant women. As for results, 81% (n=8) of the articles reported that nausea and vomiting were lower in incidence and/or intensity in the intervention group. **Conclusions:** the review provided relevant data on the effects of auriculotherapy in nausea and vomiting treatment, with a decrease in the intensity and frequency of these symptoms in different populations.

Descriptors: Auriculotherapy; Integrative Practices; Systematic Review; Nausea; Vomiting.

RESUMO

Objetivos: identificar a eficácia da auriculoterapia no tratamento de náuseas e vômitos através de uma revisão sistemática da literatura científica. **Métodos:** foi realizada uma revisão sistemática da literatura nas bases de dados Scopus, PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Web of Science, LILACS e Cochrane. Foram selecionados artigos de pesquisas completas de ensaios clínicos randomizados controlados e que descrevem o uso da auriculoterapia no tratamento de náuseas e vômitos, sem restrição de data ou idioma. **Resultados:** foram selecionados 11 artigos para análise. A maioria abordou população em situações cirúrgicas, seguidos de pacientes em quimioterapia e gestantes. Quanto aos resultados, 81% (n=8) dos artigos reportaram que náuseas e vômitos foram menores em incidência e/ou intensidade no grupo intervenção. **Conclusão:** a revisão forneceu dados relevantes sobre os efeitos da auriculoterapia no tratamento de náuseas e vômitos, apresentando diminuição de intensidade e frequência desses sintomas em diferentes populações.

Descritores: Auriculoterapia; Práticas Integrativas; Revisão Sistemática; Náuseas; Vômitos.

RESUMEN

Objetivos: identificar la efectividad de la auriculoterapia en el tratamiento de náuseas y vômitos mediante una revisión sistemática de la literatura científica. **Métodos:** se realizó una revisión sistemática de la literatura en las bases de datos Scopus, PubMed, CINAHL, Web of Science, LILACS y Cochrane. Se seleccionaron artículos de investigación completa de ensayos clínicos controlados aleatorios que describen el uso de la auriculoterapia en el tratamiento de náuseas y vômitos, sin restricción de fecha o idioma. **Resultados:** se seleccionaron 11 artículos para su análisis. La mayoría se acercó a la población en situaciones quirúrgicas, seguida de pacientes en quimioterapia y embarazadas. En cuanto a los resultados, el 81% (n=8) de los artículos informaron que las náuseas y los vômitos fueron de menor incidencia y/o intensidad en el grupo de intervención. **Conclusiones:** la revisión aportó datos relevantes sobre los efectos de la auriculoterapia en el tratamiento de las náuseas y los vômitos, con disminución de la intensidad y frecuencia de estos síntomas en diferentes poblaciones.

Descritores: Auriculoterapia; Prácticas Integradoras; Revisión Sistemática; Náuseas; Vômitos.

INTRODUCTION

Nausea or sickness is an unpleasant, subjective sensation that can lead to vomiting, manifested mainly by sweating⁽¹⁾, while vomiting is an instinctive defense response caused by the somato-autonomic reflex integrated with the brainstem root and can have multiple causes⁽²⁾. Regardless of the cause, the pharmacological treatment for nausea and vomiting has side effects that can cause discomfort or interfere with the patient's daily activities, such as drowsiness and the feeling of dry mouth, for example⁽³⁾.

Nausea and vomiting during pregnancy express a major impact on health-related quality of life, with greater adverse effects depending on the severity of nausea and vomiting. Effects have been found in physical, social and emotional functioning, physical pain, vitality and mental health⁽³⁾.

Auriculotherapy is an integral practice of Integrative and Complementary Practices (ICPs) in the context of Traditional Chinese Medicine, where the entire human body is represented on the auricle. It is classified as a low-cost and easy-to-apply procedure and considered a less invasive method⁽⁴⁾.

Auriculotherapy promotes the psychic-organic regulation of the individual through stimuli at the energy points located in the ear, in which the whole organism is represented as a microsystem. For the application of auriculotherapy, materials such as needles, crystals and mustard seeds, among others, are used. When seeds are used, this practice can be called atrial acupressure and is characterized by not using invasive materials, having easy applicability and presenting minimal side effects⁽⁵⁾.

The mechanism of action of auriculotherapy includes the mechanical stimulation of specific areas of the auricular pavilion, since the ears have reflex points that correspond to all organs and bodily functions. The stimulation of these points triggers a series of phenomena in the brain that assist in the healing process. Thus, it promotes analgesia and treats different physical and psychological conditions⁽⁶⁾.

A recent study reported the effectiveness of auriculotherapy in chemotherapy-induced nausea and vomiting⁽⁷⁾. For digestive disorders such as nausea, the stomach is one of the most indicated auriculotherapy points, as well as the cardia point for reflux control⁽⁸⁾. However, there is a gap regarding the specific points for treating nausea and vomiting and the ideal frequency of pressure on the points per day, which will be evidenced in this review. Although there are studies focused on specific situations (pathologies)⁽⁸⁻¹⁰⁾, there is no general protocol for nausea and vomiting nor a report of the most suitable points for this treatment.

Kong, et al. (2018) highlight that medications used to control chemotherapy-induced nausea and vomiting (glucocorticoids, phenothiazines, loperamide, etc.) can have adverse effects such as mood disorders and drowsiness. Also, glucocorticoids may reduce the anti-tumor effects of some chemotherapeutic agents⁽¹¹⁾. Considering the need to relieve and/or treat the symptoms of nausea and vomiting that already represent a decrease in quality of life, as they interfere with the diet, work capacity, social life and other aspects, it is of general interest to search for effective practices with the least number of side effects.

The objective of this systematic review was to expand the understanding of the effectiveness of auriculotherapy in the treatment of nausea and vomiting.

OBJECTIVES

To identify the effectiveness of auriculotherapy in the treatment of nausea and vomiting through a systematic review of the scientific literature.

METHODS

Type of study

This is a systematic review (SR) on the effectiveness of auriculotherapy in the treatment of nausea and vomiting. The recommendations of the "Preferred Reporting Items for Systematic Reviews and Meta-Analyses" (PRISMA) guide were followed⁽¹²⁾. This study protocol was registered in PROSPERO (International prospective register of systematic reviews). The review was guided by the question: what is the effectiveness of auriculotherapy in the treatment of nausea and vomiting in its multiple causes? The question was created based on the PICO strategy (P- Population, I- Intervention, C- Comparison, O- Outcome), in which Comparison was performed with placebo groups or utilizing sham points in the analyzed studies.

Ethical considerations

Considering this is a Systematic Review, the registration in National Research Council does not apply, neither the use of Terms of consent.

Eligibility criteria

The inclusion criteria were: (1) research articles available in full, (2) methodological design compatible with a randomized controlled clinical trial, and (3) describing the use of auriculotherapy in the treatment of nausea and vomiting, without the restriction of publication, date or language.

As for exclusion criteria, informal case reports, books, reflection articles, dissertations, theses, editorials and reports were not included in the review.

Information sources

The literature search included articles indexed in the following databases: Scopus, PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Web of Science, LILACS and Cochrane, and was performed on November 4th, 2019.

Search

The following search strategy was used with Medical Subject Heading (MeSH) terms and keywords: (auriculotherapy or "auricular acupuncture" or "auricular acupressure" or "ear acupuncture" or "ear acupressure") and (nausea or vomiting) and (therapeutics or treatment) for Scopus, PubMed, CINAHL and Web of Science and LILACS databases. In Cochrane, the following strategy was used:

“auriculotherapy” or “auricular acupuncture” or “auricular acupressure” or “ear acupuncture” or “ear acupressure” in Title Abstract Keyword and “nausea” or “vomiting” in Title Abstract Keyword and “therapeutics” or “treatment” in Title Abstract Keyword.

Study selection

The process of searching, reading and selecting articles was carried out by two reviewers (NBMF, FASA) in a paired and independent way, using the same databases and search strategies. In the article selection phase, disagreements were discussed later among the reviewers until reaching a consensus. If there was no consensus, the inclusion or exclusion decision would be taken by a third reviewer (JCM) independently. All exclusions were in common agreement between the two reviewers thus, there was no need for a third opinion during the selection period.

The articles were selected by reading the title and abstract and those that did not meet the inclusion criteria were excluded. In the second reading in full, incompatible articles with the study were also excluded.

Data collection process

Data of selected articles were extracted using a form prepared by the reviewers. One of the reviewers extracted the data (NBMF), which was verified by the second reviewer (FASA). In case of disagreement, its inclusion or exclusion would be decided by a third reviewer (JCM) independently. The extracted data were: title, database, journal, type of study, objective, methodology, level of health care and results of the study.

The final sample was categorized and analyzed according to the effects of auriculotherapy, technique and points used, instrument for assessing the intensity and/or incidence of nausea and vomiting, and length of treatment.

List of data

Population consisted in people with symptoms of nausea and vomiting; intervention was auriculotherapy and its variations (electro-auriculotherapy); comparison was made with other treatments, placebo and sham points; results were given by reduction or resolution of nausea and/or vomiting.

Risk of bias in individual studies

The quality and risk of bias of randomized clinical trials were assessed using the Cochrane Risk of Bias for randomized trials (RoB 2)⁽¹³⁾ instrument, August 22nd, 2019 version. The instrument requires the user to clarify which outcome is being evaluated for risk of bias and has five bias domains for assessment. Domain 1 (D1): Bias arising from the randomization process; Domain 2 (D2): Bias due to deviations from intended interventions; Domain 3 (D3): Bias due to missing outcome data; Domain 4 (D4): Bias in the measurement of the outcome; Domain 5 (D5): Bias in the selection of the reported result⁽¹³⁾. Each domain has sub-items that must be answered with the options “Not applicable”, “Yes”, “Probably Yes”, “No”, “Probably No” and “Not Informed”.

When completed, responses should be checked according to the flowcharts with a guide for using the tool. The choice of answers will determine the risk of bias in each domain and is divided into “Low risk of bias”, “Some concerns” and “High risk of bias”. After evaluating the domains, the researcher must judge the general risk of bias of the result, which can be: Low risk of bias - when the study is considered low risk in all domains; Some concerns - when the study raises some questions in one domain, but there is no high risk of bias in other domains; High risk of bias - the study is considered to be at high risk of bias for one domain or the study is considered to have some problems in many domains, thereby reducing the reliability of results⁽¹³⁾.

The risk of bias was assessed by two reviewers (NBMF, FASA) without any link to any institution, authors, or journals of the studies evaluated. The risk of bias was assessed for (1) randomization process (2) deviations from the intended interventions (effect of assignment to intervention), (3) missing outcome data, (4) measurement of the outcome, and (5) selection of the reported outcome. The risk of bias could be high (red), of some concerns (yellow) or low (green).

The participant was defined as the patient receiving auriculotherapy, and personnel was defined as the acupuncturist and/or research team who carried out the intervention. The outcome assessor was defined as the person who assessed the main outcome parameter of the auriculotherapy session.

Synthesis of results

A structured synthesis of data summarized the clinical trials included in the review. The characteristics of studies and assessment of the risk of bias were presented descriptively. Given the low number of studies, heterogeneity of populations studied (multiple pathogens) and lack of full data on the intervention in some of the studies, the performance of a meta-analysis or analysis of subgroups was impossible.

RESULTS

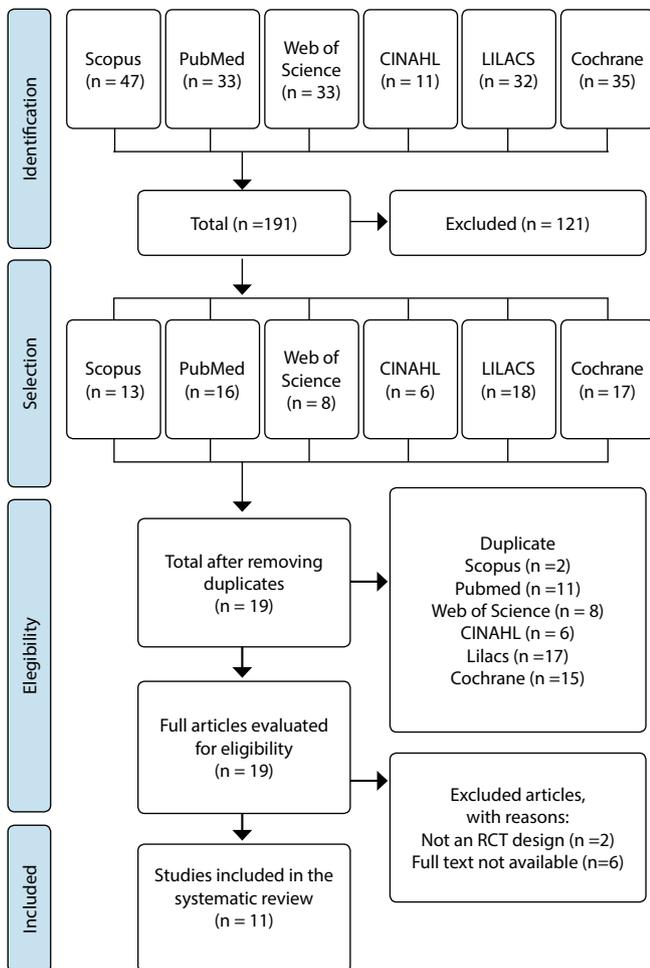
The articles were published from 2003 and the most recent publication was in 2018 (article 1). There is a small number of publications related to auriculotherapy in nausea, especially in the population of pregnant women, which was observed only in one study⁽⁹⁾. Note that the search was performed in six databases with significant collection and relevance at the international level.

Study selection

Articles excluded because of “full text not available” reason were classified as such because of unsuccessful access to purchase link, non-return of contact made with the study author or the journal’s website, even after several attempts. The final sample resulted in 11 articles, with the included studies detailed in Chart 1.

Study characteristics

Chart 2 describes the objectives of studies, population and the instruments used to assess the incidence/frequency/intensity of nausea and vomiting in the study population.



Source: Moher et al. (2009).

Figure 1 - Flow diagram of the search and selection strategy of articles in the systematic review

Among the 11 studies included, six addressed nausea and vomiting as the primary or main outcome to be investigated^(7,9,11,14,17,19). In about half of studies, a specific scale was not used to assess nausea and vomiting, evaluating only the outcome incidence^(10,14-15,19-20). This can be explained by the fact that among the five studies that did not use scales, three (03, 05, 10) evaluated nausea and vomiting as a secondary outcome in relation to the main objective^(10,15,20).

Studies that used auriculotherapy to treat postoperative nausea and vomiting^(10,14-17,19-20) predominated, followed by chemotherapy-induced nausea and vomiting^(7,11). Only one of the studies selected was aimed at treating nausea and vomiting in pregnancy, and addressed pregnant women up to 14 weeks of gestation with use of a single point of auriculotherapy (Stomach)⁽⁹⁾.

The list of points used in auriculotherapy, the pressure time applied to the spheres and/or needles, the total treatment time and the observed effects resulting from auriculotherapy are described in Chart 3.

Except for one study⁽⁹⁾, all clinical trials used the Shenmen auriculotherapy point. The second most used point was the Stomach, followed by the Sympathetic, Subcortex, Cardia and Point Zero. As for the pressure time applied to each point, there was a variation between 30 seconds and 5 minutes. The frequency of ear stimuli varied between three and four times a day and the total treatment time between 12 hours and 21 days. Regarding the material, the use of semi-permanent needles was predominant in 45% of the studies (n=5)^(10,15,17-19), followed by vegetable seeds in 36% of studies (n=4)^(7,11,16,20) and spheres in 18% (n=2)^(9,14).

Regarding the results, 81% (n=8) of articles reported that nausea and vomiting were significantly lower in incidence and/or intensity in the intervention group compared to the control group and/or the group that used sham points (points that are close or different from the treatment points)^(7,11,14-19).

The risk of bias in the studies is detailed in Chart 4.

Chart 1 - Articles selected for the systematic review, database used, year, title, and author

Author / Year	Database	Title
01 Feng et al. ⁽¹⁴⁾ (2017)	Scopus	Auricular acupressure in the prevention of postoperative nausea and emesis: A randomized controlled trial ⁽¹⁴⁾
02 Eghbali et al. ⁽⁷⁾ (2016)	Scopus	Effect of auricular acupressure on nausea and vomiting caused by chemotherapy among breast cancer patients ⁽⁷⁾
03 Chen et al. ⁽¹⁵⁾ (2015)	Scopus	Acupuncture for pain relief after total knee arthroplasty: A randomized controlled trial ⁽¹⁵⁾
04 Chung et al. ⁽¹⁶⁾ (2014)	Scopus	Acupoint stimulation to improve analgesia quality for lumbar spine surgical patients ⁽¹⁶⁾
05 Wetzel et al. ⁽¹⁰⁾ (2011)	Scopus	The effect of auricular acupuncture on fentanyl requirement during hip arthroplasty: A randomized controlled trial ⁽¹⁰⁾
06 Sahmeddini, Fazlzadeh ⁽¹⁷⁾ (2008)	Scopus	Does auricular acupuncture reduce postoperative vomiting after cholecystectomy? ⁽¹⁷⁾
07 Puangsricharn, Mahasukhon ⁽⁹⁾ (2008)	Scopus	Effectiveness of auricular acupressure in the treatment of nausea and vomiting in early pregnancy ⁽⁹⁾
08 Sator-Katzenschlager ⁽¹⁸⁾ (2006)	Scopus	Auricular electro-acupuncture as an additional perioperative analgesic method during oocyte aspiration in IVF treatment ⁽¹⁸⁾
09 Kim, Kim, Kim ⁽¹⁹⁾ (2003)	Scopus	Clinical observations on postoperative vomiting treated by auricular acupuncture ⁽¹⁹⁾
10 Yeh, Tsou, Lee ⁽²⁰⁾ (2010)	Lilacs	Effects of auricular acupressure on pain reduction in patient-controlled analgesia after lumbar spine surgery ⁽²⁰⁾
11 Kong et al. ⁽¹¹⁾ (2018)	Cochrane	Auricular point acupressure improved nausea, vomiting, diarrhea and nutritional status in gastric cancer patients receiving oral s-1 therapy ⁽¹¹⁾

Chart 2 - List of the objectives of systematic review studies, sample size and use of instruments to assess nausea and vomiting

Study (author, year, country)	Study objectives	Population	Use of instruments in the assessment of nausea and vomiting
01 Feng et al. ⁽¹⁴⁾ (2017) USA	To investigate the benefits of auricular acupressure compared to sham points or placebo using a reduction in nausea postoperatively as the primary outcome after general anesthesia for knee arthroscopy patients at high-risk for Postoperative nausea and vomiting.	150 adult patients in the postoperative period of arthroscopy. Test (auriculotherapy with gold spheres) 50 patients; Placebo (transparent adhesive only): 53 patients; Sham points: 47 patients (gold spheres 5 mm from the treatment points).	No specific instrument was used. The incidence was found based on the number of episodes of nausea and vomiting.
02 Eghbali et al. ⁽⁷⁾ (2016) Iran	To determine the effect of auricular acupressure in relieving nausea and vomiting among women who received chemotherapy.	48 women undergoing chemotherapy. Intervention: 24 women (drug of choice for nausea and auriculotherapy with seeds); Control: 24 women (drug of choice for nausea).	Morrow Assessment of nausea and emesis.
03 Chen et al. ⁽¹⁵⁾ (2015) Taiwan	To test whether the acupuncture therapy protocol, including knee Electro-acupuncture scalp acupuncture and auricular acupuncture of specific points are superior to sham auricular acupuncture in analgesia.	62 adult patients in the knee arthroplasty postoperative. Intervention: 31 patients (auriculotherapy with semi-permanent needles); Sham group: 31 patients (semi-permanent needles with the tips folded at the same points as the intervention group).	No specific instrument was used. The incidence was found based on the number of episodes of nausea and vomiting.
04 Chung et al. ⁽¹⁶⁾ (2014) Taiwan	To examine the effects of acupoint stimulation on postoperative analgesia quality, analgesic consumption, and severity during postoperative nausea and vomiting among three groups.	135 adult patients in the postoperative period of lumbar spine surgery. Intervention: 45 patients (auriculotherapy with seeds); Sham group: 45 patients (adhesive only, without seeds); Control: 45 patients (without auriculotherapy, only standard treatment).	Rhodes Index of Nausea, Vomiting and Retching.
05 Wetzel et al. ⁽¹⁰⁾ (2011) Germany	To assess if auriculotherapy reduces the need for intraoperative analgesics during total hip arthroplasty.	120 adult patients in the intraoperative period of hip arthroplasty. Intervention: 60 patients (auriculotherapy with semi-permanent needles); Sham group: 60 patients (auriculotherapy at points not related to treatment points).	No specific instrument was used. The incidence was found based on the number of episodes of nausea and vomiting.
06 Sahmeddini, Fazelzadeh ⁽¹⁷⁾ (2008) Iran	To assess the effectiveness of auricular acupuncture in preventing postoperative nausea and vomiting after cholecystectomy.	100 adult patients in the postoperative period of cholecystectomy. Intervention: 50 patients (auriculotherapy with needles); Control: standard treatment.	Visual Analogue Scale.
07 Puangsricharern, Mahasukhon ⁽⁹⁾ (2008) Bangkok	To evaluate the effectiveness of auricular acupressure in the treatment of nausea and vomiting in early pregnancy.	98 pregnant women. Intervention: 49 pregnant women (auriculotherapy with a magnetic sphere and 50mg of dimenhydrat every 6 hours in case of intolerable nausea/vomiting); 49 pregnant women (50mg of dimenhydrat every 6 hours in case of intolerable nausea/vomiting).	Rhodes Index of Nausea, Vomiting and Retching.
08 Sator-Katzenschlager ⁽¹⁸⁾ (2006) Austria	To compare the pain-relieving effect and the subjective wellbeing between auricular electro-acupuncture analgesia, auricular acupuncture and conventional analgesia with remifentanyl.	94 women in oocyte collection procedure for in vitro fertilization. Auricular electro-acupuncture (disposable titanium needles, 2 mA stimulus): 32 women; auriculotherapy with needles: 32 women; control (adhesive without needles): 32 women.	Visual Analogue Scale.
09 Kim, Kim, Kim (2003) ⁽¹⁹⁾ South Korea	To evaluate auricular acupuncture as an antiemetic treatment for postoperative vomiting episodes after transabdominal hysterectomy.	100 women in the postoperative period of abdominal hysterectomy. Intervention (needle auriculotherapy): 50 women; control (without intervention): 50 women.	No specific instrument was used. The incidence was found based on the number of episodes of nausea and vomiting.
10 Yeh, Tsou, Lee ⁽²⁰⁾ (2010) Taiwan	To examine the adjuvant effects of auricular acupressure in increasing patient-controlled intravenous analgesia with morphine and droperidol for postoperative lumbar surgery in terms of satisfaction with postoperative pain relief and the incidence of postoperative nausea and vomiting.	74 adult patients in the postoperative period of lumbar surgery. Intervention (auriculotherapy with seeds): 36 patients; control (standard treatment with analgesics and antiemetics): 38 patients.	No specific instrument was used. The incidence was found based on the number of episodes of nausea and vomiting.
11 Kong et al. ⁽¹¹⁾ (2018) China	To explore the effectiveness of auricular acupressure in controlling gastrointestinal dysfunction and improving nutritional status in cancer patients receiving oral S-1 treatment.	95 adult patients undergoing chemotherapy for gastric cancer. Intervention (auriculotherapy with seeds): 49 patients; control (auriculotherapy at points not connected to the digestive system): 46 patients.	Guideline of the National Cancer Institute for common toxicity criteria.

Chart 3 - List of auriculotherapy points used, time of pressure applied to seeds and/or spheres, total time of treatment and effects

Study	Points used	Pressure time and frequency applied	Total treatment time	Effects of auriculotherapy	
01	Feng et al. ⁽¹⁴⁾ (2017)	Shenmen, Point Zero and Subcortex.	Not informed	24 hours	There was significantly less nausea in the intervention group compared to placebo (p=0.000), both in the Post-Anesthesia Care Unit and in the 24-hour telephone follow-up. Nausea decreased, but the number of vomiting episodes showed no significant difference.
02	Eghbali et al. ⁽⁷⁾ (2016)	Point Zero, Stomach, Brainstem, Shenmen and Cardia.	3 minutes at each point, 3 times a day.	5 days	The number and intensity of nausea episodes in the groups that received auricular acupressure were lower compared to the group that did not receive it (p <0.001).
03	Chen et al. ⁽¹⁵⁾ (2015)	Shenmen, Knee, Sympathetic.	5 minutes if pain.	48 hours	10% of patients in the intervention group had nausea, compared to 50% of patients in the control group (p=0.002).
04	Chung et al. ⁽¹⁶⁾ (2014)	Shenmen, Lumbosacral, Kidneys, Subcortex and Stomach	3 minutes at each point.	3 days	The severity of post-operative nausea and vomiting was reduced during the first 72 hours after surgery (p=0.02). Greater need for the use of antiemetics by the control group.
05	Wetzel et al. ⁽¹⁰⁾ (2011)	Hip, Shenmen and Lung	Not informed	Not informed	There were no significant differences in the incidence of nausea between groups (p=0.18). Although the incidence in the intervention group (6 patients) was lower than the control group (11 patients).
06	Sahmeddini, Fazelzadeh ⁽¹⁷⁾ (2008)	Sympathetic, Stomach, Shenmen, Occiput.	Not informed	Not informed	The incidence of vomiting episodes in the treatment group was 0%, while in the control group it was 66% (p<0.01). The incidence of nausea in the treatment group was 6% and in the control group 74%.
07	Puangrucharern, Mahasukhon ⁽⁹⁾ (2008)	Stomach	30 seconds, 4 times a day.	6 days	The scores in the intervention group were lower than the control group. However, when comparing the averages of the Rhodes Index of Nausea, Vomiting and Retching scale, there was no significant difference (p>0.05).
08	Sator-Katzenschlager ⁽¹⁸⁾ (2006)	Shenmen, Uterus, Cushion.	Not informed	24 hours	Seven patients in the auricular electro-acupuncture group (21.9%), five patients in the auricular acupuncture group (15.6%) and seven patients in the control group (24.1%) reported nausea during the procedure with no significant difference between the groups (p=0.6904). After surgery, only two patients in the control group (6.9%) reported nausea and vomiting (p<0.001).
09	Kim, Kim, Kim ⁽¹⁹⁾ (2003)	Shenmen, Sympathetic, Stomach, Occipital.	Not informed	12 hours	There was a statistically significant difference between the control group and the auricular acupuncture treatment group in the incidence of vomiting in the first 12 hours after surgery (68% and 30%, respectively, p<0.01). At all other times when vomiting was evaluated, the incidence was lower in the treatment group compared to the control group.
10	Yeh, Tsou, Lee ⁽²⁰⁾ (2010)	Shenmen, Occipital, Lumbosacral Vertebra, Stomach, Cardia and Endocrine	3 minutes at each point, 4 times a day.	3 days.	The study did not support the use of auriculotherapy to treat postoperative nausea and vomiting. The incidence of nausea and vomiting was slightly higher in the control group, although it was not statistically significant (p=0.68).
11	Kong et al. ⁽¹¹⁾ (2018)	Shenmen, Stomach, Cardia, Sympathetic, Subcortex, Liver and Spleen.	3 minutes, 3 times a day.	21 days.	The duration of nausea was longer in the control group as well as nausea ≥ grade 2 (p=0.019 and p=0.034, respectively). Vomiting episodes were more severe in the control group, compared to the experimental group (p<0.001).

Chart 4 - Risk of bias assessment

Study	Randomization process	Deviations from interventions	Missing outcome data	Measurement of the outcome	Selection of the reported result	Overall risk
Study 1	Low	Low	Low	Low	Low	Low
Study 2	Low	Low	Low	Low	Low	Low
Study 3	Low	Low	Low	Low	Low	Low
Study 4	Low	Low	Low	Low	Low	Low
Study 5	Low	Low	Low	High	Low	High
Study 6	Low	Low	Low	Low	Low	Low
Study 7	Low	Low	Low	High	Low	High
Study 8	Low	Low	Low	Low	Low	Low
Study 9	Some concerns	Low	Low	Low	Low	Some concerns
Study 10	Low	Low	Low	Low	Low	Low
Study 11	Low	Low	Low	Low	Low	Low

DISCUSSION

A restricted number of randomized controlled trials on auriculotherapy as a treatment for patients with nausea and vomiting has been identified. The studies evaluated in this systematic review showed a positive relationship between auriculotherapy and the treatment of nausea and vomiting; eight of the 11 studies addressed the assessment of the efficacy of auriculotherapy within situations involving surgical processes, given the side effects generated by the use of anesthesia and sedation^(10,14-20).

Among the clinical trials analyzed, nine out of the 11 studies reported the effectiveness of using auriculotherapy in the treatment of nausea and/or vomiting^(7-8,11,14-19), either as the main outcome of the study or as a secondary outcome. The statistical values that report the effectiveness and significance of results are exposed in Chart 3 in the Results topic of this systematic review. The populations in which auriculotherapy has proven effective in the treatment of nausea and/or vomiting were in the postoperative period or undergoing chemotherapy. The use of the intervention in nausea and/or vomiting in the population of pregnant women was not efficient, although this audience was addressed in only one clinical trial. The type of material used in studies that reported efficacy was varied: spheres, needles, semi-permanent needles and also electro-acupuncture in a study (data on materials used is shown in Chart 2).

In studies that used points related to the central nervous system combined with points of the digestive system^(7,11,16-17,19) or only points related to the central nervous system⁽¹⁴⁻¹⁵⁾, were obtained significant results in reducing the intensity and/or frequency of nausea and vomiting. In only one study that used the combination (CNS and digestive system)⁽²⁰⁾, in a study that used points from the CNS and one point related to the affected organ (Knee)⁽¹⁰⁾ and another study that used a single point (Stomach)⁽⁹⁾ significant results in reducing nausea and vomiting were not obtained.

Studies worked with samples of between 48 and 150 participants, and many did not report using a specific scale to measure nausea and vomiting. In studies that used a scale, the most frequent were VAS and RINVR^(9,16-18).

The use of impartial and scientifically validated methods allows a better assessment of situations experienced both in the construction of knowledge through research and an impact on the assistance of health professionals⁽²¹⁾. The lack of scales for measuring nausea and vomiting favors low reliability of results. Vomiting can have several causes, and its investigation is necessary and judicious, as several factors must be analyzed, such as occurrence, intensity and previous history⁽²⁾.

Only three studies indicated the time variation when pressing the selected points, which differed depending on the technique used (needles, spheres or electrostimulation), with a variation of at least 30 seconds up to 3 minutes. The great variation is explained by the diversity of populations and scenarios addressed that made the patient susceptible to nausea and vomiting. In the study of patients undergoing chemotherapy, for example, auriculotherapy was used for the entire duration of the cycle (21 days)⁽¹¹⁾.

Regarding auricular acupressure points, there was variation in the choice according to the clinical or surgical situations of

studies. As most involved surgical situations, the main points found were not directly related to nausea and vomiting, but worked with the central nervous system (Shen Men, Point Zero, Subcortex and Sympathetic), and in some studies, the effect of decreased intensity or frequency of nausea and vomiting was a secondary outcome. In studies directly addressing gastrointestinal disorders, more specific points (Stomach and Cardia) were used.

In studies with no significant difference between the intervention group and the placebo group or sham point group^(9-10,20), the findings of a systematic review in the treatment of stress, anxiety and depression in adults and older adults should also be taken into account. It emphasized that the stimulation of any point in acupuncture can produce physiological effects or related to the patient's belief, while the therapeutic effect in placebo groups is explained by neurological and psychological mechanisms⁽²²⁾.

All studies analyzed, including without demonstration of the effectiveness of the intervention, reported no adverse effects or complications resulting from auriculotherapy in the study population. The review mentioned in the previous paragraph corroborates this information, reporting absent or uncommon adverse effects⁽²²⁾.

Most studies evaluated presented a low risk of bias ($n=8$)^(7,11,14-18,20). Article 5 presented a high risk of bias because of some concerns related to the measurement of the result under analysis, as it considered only the incidence of nausea and vomiting without additional parameters and it did not use any instrument or scale to assess the occurrence of symptoms⁽¹⁰⁾.

Article 7 presented a risk of bias on the measurement of result data under analysis, since data from the first two days of evaluation of the intervention and control groups were used for the control group because they did not receive auriculotherapy⁽⁹⁾. Then, on the third day of the intervention, when treatment started, data were discarded so that, according to authors, there was time for the auriculotherapy effect. Furthermore, it was not informed if the evaluators, at the post-treatment, were aware of the intervention performed on pregnant women under evaluation⁽⁹⁾. The last study, article 9, presented problems in explaining the randomization process, since there was no information whether the insertion was a sham sequence until participants were selected and directed to an intervention⁽¹⁹⁾.

Study limitations

The heterogeneity of studies in matter of clinical conditions, population profile and the utilized methods made it difficult to perform a meta-analysis of data. The small number of studies also provided few evidences to work with.

Contributions to nursing and health areas

The evidence from studies in which auriculotherapy was effective in the treatment of nausea and vomiting brought in the present study reinforce its relevance and become an incentive for its dissemination and implementation within the scope of Integrative Practices as an alternative treatment for this symptom with less adverse effects than drugs used for that purpose.

CONCLUSIONS

The review provided relevant data on the effects of auriculotherapy in the treatment of nausea and vomiting, showing a decrease in the intensity and frequency of these symptoms in different populations, including the most used points, most common techniques, total treatment time and most addressed populations. However, there are not enough studies with a high level of evidence on auriculotherapy to treat nausea and vomiting in pregnant women. More randomized and well-designed clinical studies must be performed to prove greater efficacy of auriculotherapy in different clinical situations and different levels of care. Therefore, the present review showed a gap to be filled in this theme specially among pregnant women, who were less

approached in the analyzed clinical trials. Auriculotherapy is a safe, low cost and low risk method that could be widely used by trained professionals in Basic Health Units during antenatal care after subsequent studies prove its effectiveness.

The relevance of this study lies in its contribution after obtaining data on the effectiveness of auriculotherapy in the treatment of vomiting in its multiple causes. The indication of auriculotherapy as an additional resource in nursing care is also relevant and makes nurses capable of a new branch of knowledge after training, increasing the range of options available in the therapy.

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