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REVIEW

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Effects of auriculotherapy on stress, anxiety and depression in adults and older adults: a systematic review

Efeitos da auriculoterapia sobre o estresse, ansiedade e depressão em adultos e idosos: revisão sistemática

Efectos de la auriculoterapia sobre el estrés, la ansiedad y la depresión en adultos y ancianos: una revisión sistemática

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ABSTRACT

Objective: To identify evidence in scientific literature about the effects of auriculotherapy for treating stress, anxiety and depression in adults and older adults by analyzing the main protocols for applying the intervention. **Method:** A systematic review was performed following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA). Detailed individual search strategies were applied in February 2019 in the *BDENF*, CINAHL, Cochrane, CUMED, Embase, LILACS, PEDro, PubMed, Scopus, *Segunda Opinião Formativa* (SOF) and Web of Science databases. The methodological quality of the studies was assessed using the Jadad Scale. **Results:** A total of 24 from the 859 articles found comprised the study sample. Of these, 22 (92%) showed a positive effect of auriculotherapy for stress, anxiety or depression. **Conclusion:** The available evidence on the effects of auriculotherapy on stress, anxiety and depression proves the effectiveness of the technique in adults and older adults. However, the studies showed methodological weaknesses. Although the identified protocols are different, there are frequent similar points including *Shenmen*, Kidney, Autonomic Nervous System, Heart, Brain Stem and Liver 1 and 2 which can be used in new studies.

DESCRIPTORS

Auriculotherapy; Stress Psychological; Anxiety; Depression; Complementary Therapies; Review.

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INTRODUCTION

Coping with daily life situations triggers different reactions in individuals, including stress, anxiety and depression. Individuals in these situations demonstrate general or non-specific physiological and psychological responses of the organism in facing a stressor or external and internal threats[1-5].

An intervention which can be used to prevent and control anxiety, stress and depression is auriculotherapy, constituting an integrative and complementary health practice[6-7] which can be applied by nurses in their clinical practice[8-9] by means of their training. The action mechanism of the intervention can be explained by the somatotropic function due to the presence of pluripotent cells with information about the whole organism in the ear; rich innervation and blood supply of the auricular region; and also due to the relationship of this part of the body with the energetic meridians and with the organs and viscera, according to Traditional Chinese Medicine theories (TCM)[10-11]. Unlike many allopathic drugs, the practice is non-toxic and does not cause dependence or abuse, and the contraindications are minimal[12-13].

Scientific evidence points to the effects of this intervention on stress[1,3-4,14-15], anxiety[2,11-13,16-22] and depression[23] in isolation or only in associating anxiety and depression[24-29]. However, there are few studies to date which have evaluated the three outcomes together[30]. Thus, the objective of the present review is to identify the evidence available in the scientific literature about the effects of auriculotherapy in treating stress, anxiety and depression in adults and older adults by analyzing the main protocols for applying the intervention.

METHOD

Study design

This is a systematic review of the literature based on the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[31]. The protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) under number CRD42018102691. The question which guided the study was: What are the protocols and effects of auriculotherapy (Intervention) on the levels of stress, anxiety and depression (Outcome) in adult and older adult patients (Population) compared to placebo groups, conventional treatments or no intervention (*Comparison*)?

Search strategy

The search strategy implemented in *Medline* via the *US National Library of Medicine* (PUBMED) was: ((“Auriculotherapy”[Mesh] OR “Acupuncture, Ear”[Mesh]) OR (“Auricular Acupuncture”[Title/Abstract] OR “Ear Acupuncture”[Title/Abstract] OR “Auricular Acupunctures”[Title/Abstract] OR Auriculotherapy[Title/Abstract] OR auriculopressure[Title/Abstract])) AND ((((“Anxiety”[Mesh] OR “Stress, Psychological”[Mesh]) OR “Burnout, Professional”[Mesh]) OR “Depression”[Mesh]) OR (Anxiety[Title/Abstract] OR “Psychological Stresses”[Title/Abstract] OR stress[Title/Abstract] OR Stresses[Title/Abstract] OR Burnout[Title/Abstract] OR “Professional Burnout”[Title/Abstract] OR Depression[Title/Abstract])).

The terms used in the Medline search via PubMed were considered with the help of a librarian in the health sciences area, and adapting the search strategies for all databases. The other databases used were LILACS via the Virtual Health Library (VHL), *Segunda Opinião Formativa* (SOF) via VHL, the Cuban National Medical Sciences Information Center (CUMED) via VHL, *Base de Dados Enfermagem* (*BDENF*) via VHL, Physiotherapy Evidence Database (PEDro), the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, SCOPUS, Cochrane and EMBASE. All searches in electronic databases were carried out on February 8, 2019. It should be noted that articles in the gray literature were not evaluated.

Selection criteria

The inclusion criteria adopted were: randomized controlled trials (RCTs) published in English, Spanish or Portuguese, in the last six years (2013 to 2019); and studies whose object of investigation was the effect of auriculotherapy on the levels of stress, anxiety and/or depression in individuals over 18 years of age.

Data analysis and processing

All titles found were grouped in two Microsoft Excel® spreadsheets to be evaluated independently by two reviewers. Next, the title and summary of the articles were also read independently in order to compare the results of the individual selection and discuss any disagreements. The articles were then included for reading in full upon reaching 100% agreement between the spreadsheets.

The included articles were analyzed using an instrument[10] adapted by the researchers with items from the Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA)[32]. The methodological quality of the studies was independently assessed by two reviewers using the Jadad scale[33]. There was 100% consensus on the grades attributed by each researcher at the end of the evaluation process.

The Jadad scale is an instrument composed of questions which evaluate randomization, masking and loss of follow-up in the study, in addition to the methodological suitability of these items. The questions have a yes/no answer option, with a total score of five points: three times one point for yes answers, and two additional points for appropriate methods of randomization and allocation secrecy. Studies scored less than three are of low methodological quality and their results are not suitable for clinical practice[33].

RESULTS

A total of 859 articles were found. Of these, 209 (24%) were excluded because they were duplicated and

363 (42%) because they were published more than six years ago. Thus, 287 (33%) articles remained; a further 236 were excluded after reading titles and abstracts. As a result, 51 articles were read in full, of which 27 were excluded and 24 included in the qualitative analysis (Figure 1).

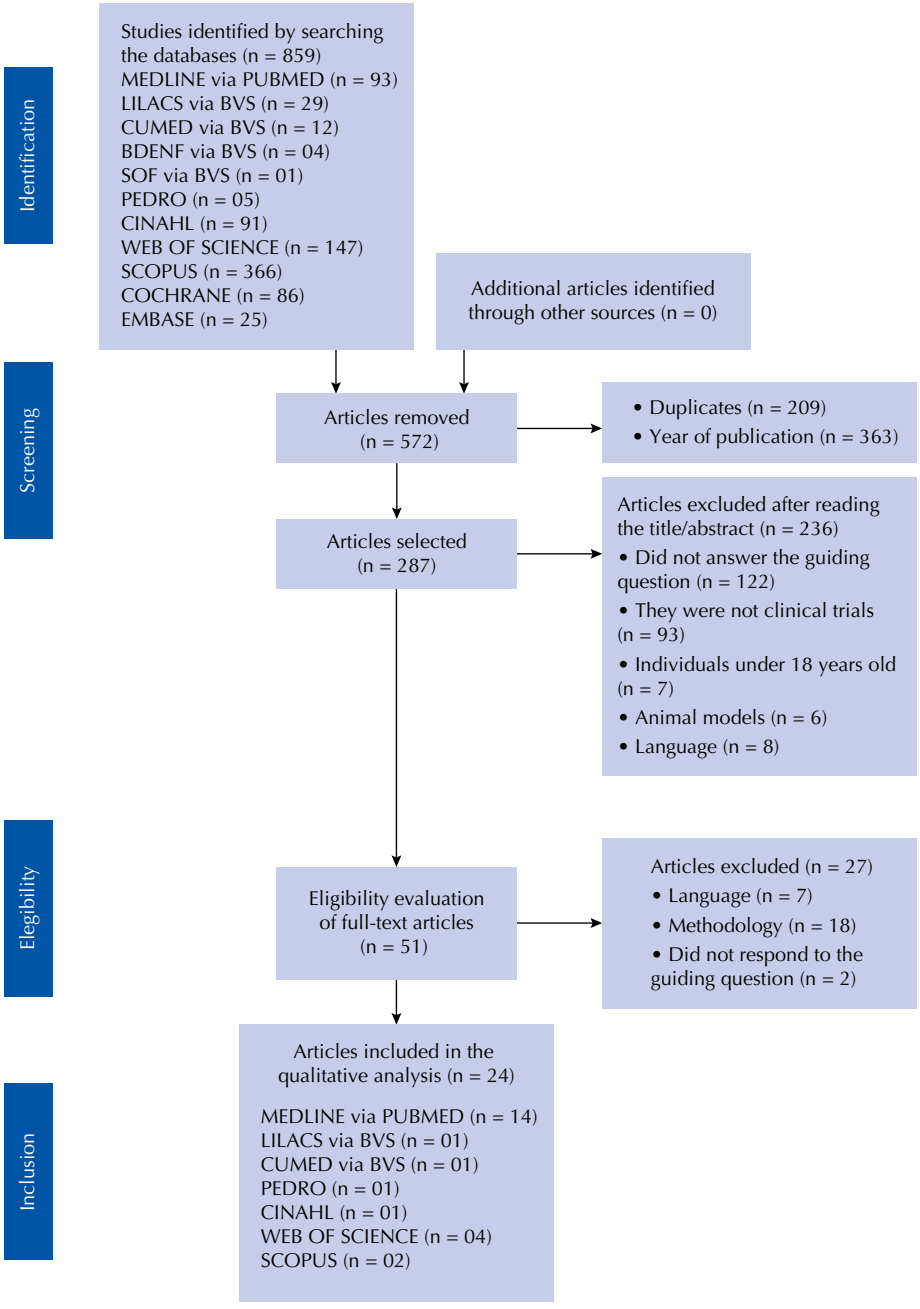

Figure 1 – Flowchart for the selection of articles in the systematic review.

The included articles were carried out in hospitals (n = 14)[1,4,14-16,18-19,21-22,24,26-27,29-30], universities (n = 2)[11,16], specialized medical centers (n = 4)[2-3,17,27], one non-governmental organization (n = 1)[23], and one long-term institution (n = 1)[20], among others[13,23]. Of these, 22 were developed in Western countries, and two in Eastern countries[24,30]. Most of the articles were published in English (n = 18; 72%), followed by articles in Portuguese (n = 6; 24%) and Spanish (n = 1; 4%).

The research sample consisted of women (n = 1412) and men (n = 403) aged between 20 and 91 years. Three of the studies[16-18] were only conducted with women; and three[2,13-14] did not describe the number of participants according to gender. Therefore, there was a total 265 individuals included. The objectives, research variables, interventions, main results and the methodological quality of the studies included in the systematic review are described in Chart 1.

A total of 22 (92%) articles showed a positive effect of auriculotherapy on stress[1,3-4,14-15,30], anxiety[2,11-13,16-19,20,22,24-26,28-30] or depression[23-26,28-30]. The main tools for measuring outcomes were: List of Symptoms of Stress (LSS)[1,4,14-15], the State-Trait Anxiety Inventory (STAI)[11-12,17-20,22,27], and the Hamilton Anxiety and Depression Scale[24,29].

The main lines of reasoning used in studies for auriculotherapy application were Chinese[1-2,4,11,13-20,24-25,27,30], the National Acupuncture Detoxification Association (NADA) protocol[3,28-29], the French line[21,26], The Auricular Protocol for Pain & Anxiety (APPA)[22], and the Gold Protocol[17]. Two of the studies did not define the theoretical foundation[12,23].

The basic training of therapists was nursing (n = 8)[1-2,14-16,18,20,22], medicine (n = 5)[2,17,26-27,29], dentistry (n = 2)[13,23] and psychology (n = 2)[14,22]; five of these had a specialization in acupuncture[2,14-15,20,22]. Furthermore, four studies only characterized the interventionists as acupuncturists[12,21,24-25], two reported that the professionals took a course[28-29] and five did not define the training area of the therapist[3-4,11,19,30]. The experience time in the area varied between two and twenty years[12,18,20-21,24,29].

Chart 1 – Study characterization – Belo Horizonte, MG, Brazil, 2019.

Authors/Year	Objective	Interventions		Main Results	Jadad*
		Experimental group(s)	Control group/placebo		
Rodrigues et al., 2019[23]	To evaluate the effects of laser EA on the physical and emotional symptoms of patients with temporomandibular joint dysfunction in comparison with the occlusive plaque.	G1: Laser auriculotherapy (n = 20).	G2: Control with occlusive plate (n = 20).	In addition to improving pain in more facial regions, EA has positive effects on the function of the temporomandibular joint and on affective symptoms.	3
Mafetoni et al., 2018[16]	To assess the effectiveness of EA on anxiety in labor.	G1: Auriculotherapy with crystals (n = 34).	G2: Placebo with glass microspheres at different points (n = 34). G3: Control without intervention (n = 34).	The parturients had a lower level of anxiety in the experimental group compared to the placebo and control groups.	5
Ndubisi et al., 2018[17]	To evaluate pain management using EA as an adjunct to ibuprofen and paracervical block during the first trimester of uterine aspiration and to evaluate the effect of EA on anxiety.	G1: Auriculotherapy with semi-permanent needles and usual care (n = 52).	G2: Placebo with adhesive tape and usual care (n = 49). G3: Control with usual care with paracervical block and ibuprofen (n = 49).	The women in the experimental group reported substantial improvement in anxiety compared to the placebo and control groups.	5
Vieira et al., 2018[11]	To evaluate the clinical effect of EA on university students' anxiety levels.	G1: Auriculotherapy with semi-permanent needles (n = 25).	G2: Placebo with auriculotherapy at different points (n = 22). G3: Control without any auricular treatment (n = 22).	The experimental group showed a significant reduction in anxiety levels according to the applied scales.	4
Dellovo et al., 2018[13]	To compare the effects of EA and midazolam to control anxiety in patients undergoing extraction of the third molar.	G1: 15 mg Midazolam orally and auriculotherapy (n = not described).	G2: Placebo of oral midazolam and auriculotherapy (n = not described).	EA showed an equivalent anxiolytic effect to midazolam without the undesirable effects related to benzodiazepines.	2
Prado et al., 2018[4]	To compare the therapeutic efficacy of true EA and Sham in a control group without intervention in treating stress identified in nurses.	G1: Auriculotherapy with needles (n = 43).	G2: Control without intervention (n = 47). G3: Placebo with random needles (n = 43).	True EA was effective when compared to the control group and had faster and more effective results than the Sham group.	3
Valiani et al., 2018[30]	To investigate the impact of EA on stress, anxiety and depression in patients with multiple sclerosis.	G1: Auriculotherapy with electrical stimulation and seeds (n = not described).	G2: Placebo with false stimulation and no seed fixation (n = not described).	The stress, anxiety and depression scores decreased significantly when compared to the placebo group.	2
Carter et al., 2017[28]	To determine whether the National Acupuncture Detoxification Association (NADA) protocol and traditional treatments improve quality of life, depression, anxiety and substance withdrawal.	G1: Auriculotherapy with systemic needles and usual treatment (n = 50).	G2: Conventional treatment control with guidelines and therapy groups (n = 50).	The NADA group showed significant improvements in symptoms associated with depression.	3
Kurebayashi et al., 2017[22]	To evaluate the effectiveness of an auricular protocol for reducing anxiety, pain and improving quality of life in the nursing staff of a hospital.	G1: Auriculotherapy with seeds (n = 35). G2: Auriculotherapy with semi-permanent needles (n = 34).	G3: Control without intervention (n = 31). G4: Placebo with auriculotherapy with adhesive tape at the same points as G1/G2 (n = 33).	The implemented protocol reduced the anxiety levels in the nursing team after 10 sessions. The group with semi-permanent needles achieved better results.	3

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Authors/Year	Objective	Interventions		Main Results	Jadad*
		Experimental group(s)	Control group/placebo		
Bergdahl et al., 2017[29]	To evaluate the effects of EA and cognitive behavioral therapy in relation to the discontinuation of hypnotic use for symptoms of anxiety, depression and insomnia.	G1: Auriculotherapy with systemic needles (n = 24).	G2: Control with cognitive behavioral therapy for insomnia (n = 25).	Short-term reductions occurred in the EA group regarding symptoms of anxiety and depression.	3
Ahlberg et al., 2016[21]	To investigate the effectiveness of two types of EA for anxiety, sleep, alcohol and drug use and the use of addiction services.	G1 (NADA)/G2 (Local protocol): Auriculotherapy with systemic needle (G1/G2 n = 80/80).	G3: Control with relaxation technique (n = 80).	No evidence was found that EA is more effective than relaxation for problems with anxiety in patients with psychiatric disorders and substance abuse.	3
Bergdahl et al., 2016[26]	To compare the effectiveness of EA treatment versus cognitive behavioral therapy for insomnia.	G1: Auriculotherapy with systemic needles (n = 27).	G2: Control with cognitive behavioral therapy for insomnia (n = 32).	Depression scores declined regarding EA, but there were no significant changes in relation to anxiety.	3
Jonas et al., 2016[27]	To determine whether two types of acupuncture (ear acupuncture and systemic acupuncture) are feasible and more effective than the usual treatment for headache related to traumatic brain injury.	G1 (EA): Auriculotherapy with semi-permanent needles (n = 15) G2 (systemic acupuncture) (n = 14).	G3: Conventional treatment included combined drugs. The non-drug treatment options were physical, occupational therapy and speech therapy.	No statistically significant results were found for depression and anxiety.	3
Klausenitz et al., 2016[12]	To investigate whether EA reduces anxiety before tests compared to a placebo group or without intervention.	G1: Auriculotherapy with semi-permanent needles (n = 12).	G2: Placebo with random needles (n = 13). G3: Control with conversation for distraction (n = 15).	The EA and placebo group reduced anxiety. In addition, EA had superior effects over placebo.	3
Rivadeneira et al., 2015[2]	To determine the effectiveness of EA in older adult patients suffering from anxiety compared to conventional treatment.	G1: Auriculotherapy with seeds (n = 30).	G2: Usual treatment with 10mg chlorodiazepoxide 3 times a day and 1 mg tifluoperacin 3 times a day (n = 30).	EA proved to be more effective. In addition, it is a practically harmless technique with which the use of psychotropic drugs can be reduced.	2
Iunes et al., 2015[20]	To evaluate the role of EA in treating temporomandibular disorders, anxiety and electromyographic activity in university students.	G1: Auriculotherapy with seeds (n = 40).	G2: Placebo with seeds placed at distant points from the experimental group (n = 13).	Anxiety and pain were significantly reduced in individuals who received EA.	3
Jiao et al., 2015[24]	To identify the ideal treatment protocol for insomnia between ear, body and abdominal needling procedures.	G1: Systemic Acupuncture (n = 12); G2: Auriculotherapy with systemic needles (n = 12); and G3: Abdominal Acupuncture (n = 12).	G1/G2/G3: Control without intervention in subgroups (n = 18).	Ear acupuncture had a clear therapeutic effect on insomnia, depression and anxiety.	2
Kurebayashi et al., 2015[15]	To evaluate the effectiveness of EA for improving quality of life and reducing stress in the nursing team.	G1 (protocol)/G2 (without protocol): EA with semi-permanent needles (G1/G2 n = 58/59).	G3: Control without intervention (n = 58).	Individualized auriculotherapy had a greater effect than auriculotherapy with a stress reduction protocol.	1
Rodríguez-Mansilla et al., 2015[25]	To learn about the effectiveness of auricular acupressure and massage versus control group in improving pain, anxiety and depression in people diagnosed with dementia.	G1: Auriculotherapy with seeds (n = 40). G2: Massage with *effleurage* technique and deep kneading (n = 35).	G3: Control with usual care (n = 36).	Auricular acupressure and massage therapy showed better results than the control group in relation to anxiety and depression. A trial acupressure achieved more significant results.	5
Széchenyi et al., 2015[3]	To assess whether the EA protocol has immediate stress reduction (prolactin - PRL) and, if so, whether the effect is more significant than social support and informal support conversation.	G1: Auriculotherapy with systemic needles (n = 22).	G2: Control group with social support and informal conversation (n = 21).	The stress level (PRL and conductance) can be significantly reduced using the NADA protocol.	1

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Authors/Year	Objective	Interventions		Main Results	Jadad*
		Experimental group(s)	Control group/placebo		
Kurebayashi et al., 2014[1]	To identify the main diagnoses of TCM based on the analysis of the symptoms from the Stress Symptoms List which best responded to auriculotherapy treatment.	G1: Auriculotherapy with semi-permanent needles (n = 27). G2: Auriculotherapy with seeds (n = 26).	G3: Control without intervention (n = 22).	Better results were found for needles than for seeds.	3
Kurebayashi et al., 2014[14]	To evaluate the effectiveness of EA with and without a protocol for reducing the stress levels of the nursing team.	G1 (protocol)/G2 (without protocol): Auriculotherapy with semi-permanent needles (G1/G2 n = 58/59).	G3: Control without intervention (n = 58).	EA with and without protocol was effective in reducing stress levels. But the scope of the technique was extended without a protocol.	3
Gagliardi et al., 2014[19]	To evaluate the sedative-anxiolytic effect of EA in health professionals by comparing the effect of real and fake needles.	G1: Auriculotherapy with semi-permanent needles (n = not described).	G2: Placebo with false needles (n = not described).	Auriculotherapy had a significant effect on the volunteer's state-anxiety compared with the placebo group.	0
Hadad-Rodrigues et al., 2013[18]	To evaluate the effectiveness of acupuncture versus placebo acupuncture in the anxiety of nursing mothers with preterm and low birth weight babies.	G1: Auriculotherapy with semi-permanent needles (n = 14).	G2: Placebo with customized needles which did not pierce the skin.	There was no difference between the acupuncture and placebo acupuncture groups for anxiety in mothers with preterm babies. However, there were statistically significant improvements for anxiety in the group analyzes.	5

Note: * Scale ranges from 0-5 points. G1 = Group 1. G2 = Group 2. G3 = Group 3. n = sample number. TCM = Traditional Chinese Medicine. EA = Ear Acupuncture (n=24).

Auriculotherapy was performed using pre-established protocols[1-4,11-13,16-30] or determined according to the individualized assessment[14-15]. The location of the points was mentioned in six articles[1,14-16,19,22], using a locator[1], a hand probe[4,16,22] and an algometer with a permanent pen[19]. The auriculotherapy treatment protocol in the experimental groups is described in Chart 2.

The application devices were fixed unilaterally[18,20,22-24] or bilaterally[12,17,21,26-28]. The main care maintenance related to the seed was manual stimulation of the points. Thus, participants were instructed to stimulate the points four times a day[1], five times a day for one minute, or until they felt pain or discomfort[20], or three times a day for 15 days[22]. In one case, stimulation was instructed for three to five minutes in the presence of anxiety[12]. Three of the articles did not describe seed care[1,13,25]. Systemic needles were introduced and maintained without total insertion into the skin[24], or to a depth of two to three millimeters[21,28-29]. Manual seed stimulation was only described in one experiment[21]. In turn, care with semi-permanent needles was not described.

The device removal varied so that the systemic needles were removed between 30 and 45 minutes[21,26,28-29]. Moreover, the semi-permanent needles were kept for one day[12], two[11,22] days, three days, or removed in case of pain or redness[27]. In addition, one study pointed to removal at one week[18], while others described changing the seeds twice a week[4,14,18] without specifying the time interval. The seeds had a residence time of two[22], three[20,30], five[13], seven[1-2] and fifteen days[25]. New applications were performed after removing the devices, alternating the ears[18,20,24].

Chart 2 – Auriculotherapy treatment protocol – Belo Horizonte, MG, Brazil, 2019.

Authors/Year	Treatment points	Device	Sessions		
			Number	Frequency	Duration
Rodrigues et al., 2019[23]	**G1**: *Shenmen*, Temporamandibular dysfunction, heart.	Laser irradiation at 4 J/cm² for 24 seconds	8 sessions	1x/week	1 week
Mafetoni et al., 2018[16]	**G1**: *Shenmen*, Uterus, Neurasthenia, Endocrine.	Polished crystal microspheres (1.5 mm)	1 session	1x	1 day
Ndubisi et al., 2018[17]	**G1**: Cingulate gyrus, Thalamus, Zero point, Cervix, Uterus, *Shenmen*.	Semi-permanent needles (0.2x1.2 mm)	-	-	-
Vieira et al., 2018[11]	**G1**: Diazepam, Pulmonary parenchyma, Anxiety, Psychosomatic, Happiness.	Semi-permanent needles (3 mm)	1 session	1x	2 days

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Authors/Year	Treatment points	Device	Sessions		
			Number	Frequency	Duration
Dellovo et al., 2018[13]	**G1**: *Shenmen*, Kidney, Sympathetic, Anxiety, Neurasthenia, Heart, Liver.	Mustard seed (*Brassica juncea*)	1 session	1x/week	5 days
Prado et al., 2018[4]	**G1**: *Shenmen* and Brainstem.	Semi-permanent needle	12 sessions	2x/week	6 weeks
Valiani et al., 2018[30]	**G1**: *Shenmen*, Relaxing, Zero, Talamic, Shoulder Master, Tranquilizer, Thymus, Adrenal, Master Oscillation, Brain Stem.	Cow seed	10 sessions	2x/week	3 days
Carter et al., 2017[28]	**G1 (NADA Protocol)**: Sympathetic, *Shenmen*, Lung, Kidney, Liver.	Stainless steel needle with fluorescent plastic handles (0.20x7 mm)	24 sessions	2x/week	10 to 12 weeks
Kurebayashi et al., 2017[22]	**G1/G2**: *Shenmen*, Tranquilizer, Thalamus, Autonomic or Sympathetic System, Zero Point.	Semi-permanent needle and seed	10 sessions	2x/week	5 weeks
Bergdahl et al., 2017[29]	**G1 (NADA Protocol)**: *Shenmen*, Kidney, Sympathetic, Lung, Liver.	*Zhongyan Taihe* sterile stainless systemic acupuncture needle (0.18x13 mm)	8 sessions	2x/week	4 weeks
Ahlberg et al., 2016[21]	**G1 (NADA Protocol)**: Sympathetic, *Shenmen*, Kidney, liver, lung. **G2 (Local protocol)**: not described.	Stainless steel systemic acupuncture needle (0.25x13 mm)	G1: 15/G2: 10 sessions	-	-
Bergdahl et al., 2016[26]	**G1 (NADA Protocol)**: *Shenmen*, Kidney, Sympathetic, Liver, Lung.	*Zhongyan* stainless steel systemic acupuncture needle	8 sessions	2x/week	4 weeks
Jonas et al., 2016[27]	**G1**: Point N, Omega 2, *Shenmen*, Point Zero, Cingulate gyrus, External thalamus.	SEIRIN L needle (20x30 mm) or semi-permanent gold needle	10 sessions	2x/week	6 weeks
Klausenitz et al., 2016[12]	**G1**: Lung, *Shenmen*, Kidney, Subcortex, Adrenal.	New Pyonex fixed needle (1.5x0.22 mm)	1 session	1x	2 days
Rivadeneira et al., 2015[2]	**G1**: *Shenmen*, Occipital, Heart, Liver, Spleen, Kidney.	*Argemona Mejicana* L. Seed	8 sessions	1x/week	8 weeks
Iunes et al., 2015[20]	**G1**: *Shenmen*, Kidney, Sympathetic, Brainstem, Temporamandibular dysfunction.	Mustard seed	10 sessions	2x/week	6 weeks
Jiao et al., 2015[24]	**G2**: Subgroup 1: *Shenmen*, Occipital, *Chuiqian*, Subcortex. Subgroup 3 (TCM): basic points + Spleen, Stomach, Heart, Liver.	1 cun systemic acupuncture needle (0.25x25 mm)	20 sessions	-	6 weeks and 2 days
Kurebayashi et al., 2015[15]	**G1 (with protocol)**: *Shenmen*, Brain Stem, Kidney, Liver *Yang* 1 and 2. **G2 (without protocol)**: practically the same as the protocol, with Stomach, Spleen and musculoskeletal pain points.	Semi-permanent needle	12 sessions	2x/week	6 weeks
Rodríguez-Mansilla et al., 2015[25]	**G1**: *Shenmen*, Muscle Relaxer, Xin Heart.	Vacaria seed (Ener-Qi®)	6 sessions	2x/month	3 months
Széchenyi et al., 2015[3]	**G1 (NADA Protocol)**: *Shenmen*, Sympathetic, Kidney, Liver, Lung.	Systemic acupuncture needle	-	-	-
Kurebayashi et al., 2014[1]	**G1/G2**: *Shenmen*, Kidney, Cerebral Stem.	Semi-permanent needle and seed	8 sessions	1x/week	8 weeks
Kurebayashi et al., 2014[14]	**G1 (with protocol)**: *Shenmen*, Brain Stem, Kidney, Liver *Yang* 1 and 2. **G2 (without protocol)**: Kidney, Brain Stem, *Shenmen*, Liver *Yang* 1 and 2, Cervical, Lumbar, Stomach, Spleen, Liver, Lung, Endocrine, Apex.	Semi-permanent needle	12 sessions	2x/week	6 weeks
Gagliardi et al., 2014[19]	**G1**: Not described.	Semi-permanent needle (0.22x1.5 mm)	-	-	-
Hadad-Rodrigues et al., 2013[18]	**G1**: *Shenmen*, Muscle Relaxation, Tension, Anxiety 1, Anxiety 2.	Semi-permanent needles (1.0 × 1.5 mm)	12 sessions	1x/week	16 to 83 days

Notes: G1 = Group 1. G2 = Group 2. NADA = *National Acupuncture Detoxification Association* (n=24).

DISCUSSION

Auriculotherapy was effective in most studies and in different clinical situations of stress, anxiety and depression, such as for multiple sclerosis, alcohol and drug abuse, dementia, headache associated with traumatic brain injury, insomnia and pain[17,23-25,27-28,30]. In addition to its effectiveness, the technique proved to be minimally invasive, safe, low cost and with a short time demand for application. These

findings are corroborated by other studies[10,34] and reinforce the use of its practice in different health contexts.

The methodological quality scores assessed using the Jadad Scale demonstrate that a large part of the studies (n = 12; 50%) obtained a score of three, indicating that they were on the threshold for their clinical recommendation. Of these studies, four scored the maximum[16-18,25], one scored four[11] and seven scores were equal to or less than two[2-3,13,15,19,24,30].

It is noteworthy that the Integrative and Complementary Practices (ICPs) are inserted in the primary, secondary and tertiary areas of *SUS* (*Sistema Único de Saúde*), with an emphasis on Primary Healthcare[35]. However, the present investigation demonstrates that all RCTs were performed in tertiary and secondary environments, with no studies in Primary Healthcare. This reinforces the need for studies with greater scientific evidence in this scenario[10] in order to strengthen the recognition of ICPs as a public health strategy in Brazil.

Most of the professionals who applied the intervention in the analyzed studies were nurses. They are inserted in different levels of the Healthcare Network and are highlighted for their proximity to users, thus being potential diffusers of ICPs. This finding demonstrates advances in the literature, in which these professionals were one of the professional categories with the least number of therapists[10]. It is also noteworthy that in addition to the legal support for acupuncture and auriculotherapy by nurses[4,16], these practices are recognized as nursing interventions in classifications which standardize language such as the International Classification of Nursing Practices (ICNP®)[8] and the Nursing Interventions Classification (NIC)[9].

In relation to the intervention protocols, the devices most used for stimulating the auricular points in the experimental groups were semi-permanent needles[1,4,11-12,14-15,17,19,22,27], systemic needles[3,21,24,26,28-29] and seeds[1-2,13,20,22,25]. Two studies tested semi-permanent needles and seeds in order to compare their triggered effects[1,22]. The semi-permanent needle was more effective than that the seed in both studies. However, the seed has advantages over the needle in situations where individuals do not tolerate invasive stimuli or in children, and because it causes less pain and infection risk[36]. It should be noted that the results of the seeds depend on the correct pressure exerted by the patients. However, there are divergences in the frequency and care of seed maintenance between studies, so it is not possible to establish recommendations.

Control groups were formed by individuals who did not undergo any intervention[1,4,11,14-16,22], who continued conventional treatment[2,25,27-28], or with another type of treatment[3,21,24,26,29]. The results achieved in these groups stood out in relation to auriculotherapy in only two studies in which relaxation techniques were used[21], as well as treatment with medications and non-pharmacological options[27]. Thus, the results reinforce the use of ICPs in relation to conventional treatments and are in line with those obtained in other studies[10,37].

The placebo groups[4,11-12,18-20,22,30] demonstrated similar results to auricular therapy in two situations in which adhesive tapes were used on the points of the experimental group or false needles[18,22]. The effect of auriculotherapy was superior to that of placebo in two studies[12,19] in which needles were used without therapeutic intention or which did not pierce the skin.

Stimulation of any point in acupuncture can produce physiological effects or related to the patient's belief (placebo)[4,38]. The therapeutic effect in placebo groups is explained by neurological and psychological mechanisms[4,39]. In the first, neurotransmitters such as endogenous opioids, dopamine and serotonin are released[39-40], thereby modulating the individual's biological responses. In the second, emotional states such as anxiety and personal control change the perception of the health condition[39], increasing the individual's resilience.

In a systematic review to determine whether placebo acupuncture had the same effectiveness as acupuncture for different clinical indications, it was observed that 58% of the studies showed no statistically significant difference between experimental groups and placebos; furthermore, no placebo group had a superior effect to acupuncture[40].

The common points for stress, anxiety and depression were *Shenmen* and Kidney. The Brainstem and Liver *Yang* 1 and 2 were additionally used for treating stress. The anxiety protocols included the Autonomic or Sympathetic Nervous System. In turn, depression and anxiety had the Heart point stimulated. Thus, in view of the effectiveness and use of these points in more than one study, it is recommended to use them in new studies.

The *Shenmen* point has a sedative property, while the kidney has an energizing and invigorating function. The Brain Stem has a calming function, while Liver *Yang* 1 and 2 contain a rise in the liver *Yang*, which is an energetic pattern of stress[10,15-16,24]. The Autonomic Nervous System regulates the functioning of the sympathetic and parasympathetic nervous system, with considerable effect on muscle pain and relaxation. The Heart point controls blood circulation and mental and emotional activities, and is sedative and relaxing[14].

It is highlighted that the National Acupuncture Detoxification Association (NADA) was applied in five studies among the protocols used for stress, anxiety and depression[3,17,21,23-24]. The *Shenmen*, Kidney, Autonomic Nervous System, Liver and Lung points are stimulated through it in order to relieve symptoms of drug use and abuse, as well as severe conditions such as neurological problems, depression, anxiety, epilepsy, and insomnia, among others[3,28]. Furthermore, protocols are important tools for replicating research on auriculotherapy.

It was observed that adverse events (AE) related to auriculotherapy are absent[17] or uncommon. Only headaches, bleeding at the needle application site[12] and local pain[22] were identified in the studies. A review on the AE of auricular therapy reaffirms this finding[34]. In addition, it demonstrates that when AEs occur, they are transient, tolerable and manifest as discomfort and sensitivity at the application site of the devices, skin irritation, dizziness and redness[34].

There is no consensus on the number of sessions, so these varied from one to 24 sessions, with an average of 11 sessions, and with effective results. Therefore, it is not possible to determine the number of sessions for the treatment protocol and frequency. Instruments such as the List of Symptoms of Stress (LSS), the State-Trait Anxiety Inventory (STAI) and the Hamilton Anxiety and Depression Scale associated with physiological parameters can be used in the assessments to evaluate the outcome.

The main limitation of the study was the exclusion of articles in the Chinese language, since China is the cultural center for therapies such as auriculotherapy. It is believed that the philosophy and the experience accumulated in China about the techniques can contribute to the strengthening of these treatments worldwide.

CONCLUSION

The evidence available in the literature on the effects of auriculotherapy in treating stress, anxiety and depression proves the effectiveness of the technique in adults and older adults. However, RCTs presented weaknesses in terms of methodological quality. Thus, it is suggested to conduct clinical studies with a high level of evidence to evaluate the effect of auriculotherapy for stress, anxiety and depression.

Although the identified protocols are different, there are frequent points which include *Shenmen*, Kidney, Autonomic Nervous System, Heart, Brain Stem and Liver 1 and 2 which can be used in new studies, since they were effective for these conditions which have similar energetic and symptomatic characteristics. The number of treatment sessions and frequency are not uniform, and therefore it was not possible to determine them.

Finally, auriculotherapy is an ancient practice, being applied based on a philosophically-based diagnostic reasoning and meets the precepts of humanized and comprehensive care which underlies nursing practice. Thus, the use of auriculotherapy practice can be disseminated considering the nurses' role at all levels of healthcare, and in view of its effectiveness, it should help to improve the health of the population.

RESUMO

Objetivo: Identificar evidências na literatura científica acerca dos efeitos da auriculoterapia no tratamento do estresse, ansiedade e depressão em adultos e idosos, analisando os principais protocolos para a aplicação da intervenção. **Método:** Revisão sistemática seguindo os principais itens para relatar revisões sistemáticas e meta-análises (PRISMA). Em fevereiro de 2019, foram desenvolvidas estratégias detalhadas de busca individual para BDENF, CINAHL, Cochrane, CUMED, Embase, LILACS, PEDro, PubMed, Scopus, Segunda Opinião Formativa e *Web of Science*. A qualidade metodológica dos estudos foi avaliada por meio da Escala de Jadad. **Resultados:** Dos 859 artigos encontrados, 24 compuseram a amostra do estudo. Destes, 22 (92%) evidenciaram efeito positivo da auriculoterapia para estresse, ansiedade ou depressão. **Conclusão:** As evidências disponíveis acerca dos efeitos da auriculoterapia sobre o estresse, ansiedade e depressão comprovam a efetividade da técnica em indivíduos adultos e idosos. No entanto, os estudos apresentaram fragilidades metodológicas. Apesar dos protocolos identificados serem diferentes, existem pontos frequentes, dentre os quais estão *Shenmen*, Rim, Sistema Nervoso Autônomo, Coração, Tronco Cerebral e Fígado 1 e 2 que podem ser utilizados em novos estudos.

DESCRITORES

Auriculoterapia; Estresse Psicológico; Ansiedade; Depressão; Terapias Complementares; Revisão.

RESUMEN

Objetivo: Identificar la evidencia en la literatura científica sobre los efectos de la auriculoterapia em tratamiento del estrés, la ansiedad y la depresión en adultos y ancianos, analizando los principales protocolos para la aplicación de la intervención. **Método:** Examen sistemático siguiendo las principales los elementos para informar sobre los exámenes sistemáticos y metaanálisis (PRISMA). En febrero de 2019, fueron desarrolladas estrategias detalladas de búsqueda individual para BDENF, CINAHL, Cochrane, CUMED, Embase, LILACS, PEDRo, PubMed, Scopus, Segunda Opinión Formativa (SOF) y *Web of Science*. La calidad metodológica de los estudios se evaluó mediante la Escala de Jadad. **Resultados:** De los 859 artículos encontrados, 24 componían la muestra del estudio. De estos, 22 (92%) mostraron un efecto positivo de la auriculoterapia para el estrés, la ansiedad o la depresión. **Conclusión:** Las pruebas disponibles sobre los efectos de la auriculoterapia en el estrés, la ansiedad y la depresión demuestran la eficacia de la técnica en personas adultas y de edad avanzada. Sin embargo, los estudios mostraron deficiencias metodológicas. A pesar de los protocolos identificadas como diferentes, hay puntos frecuentes, entre los que se encuentran *Shenmen*, Riñón, Sistema Nervioso Autónomo, Corazón, Tronco Cerebral e Hígado 1 y 2 que pueden ser utilizados en nuevos estudios.

DESCRIPTORES

Auriculoterapia; Estrés Psicológico; Ansiedad; Depresión; Terapias Complementarias; Revisión.

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