Effects of auriculotherapy on anxiety of pregnant women receiving low-risk prenatal care

Efeitos da auriculoterapia na ansiedade de gestantes no pré-natal de baixo risco
Efectos de la auriculoterapia en la ansiedad de mujeres embarazadas en atención prenatal de bajo riesgo

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Abstract

Objective: To evaluate the effects of auriculotherapy on anxiety levels of pregnant women receiving low-risk prenatal care.

Methods: This was a randomized, single-blind clinical study conducted at a low-risk prenatal clinic in a philanthropic maternity hospital in the state of Espírito Santo, Brazil, with a sample of 50 pregnant women (25 in control group; 25 in experimental group). The intervention used was Auriculotherapy of Traditional Chinese Medicine (TCM), which is one of the practices used as microsystem acupuncture. For auriculotherapy treatment, three ear points were used together, namely the Shen Men, Kidney and Sympathetic (in Portuguese they are called *triângulo cibernético* or "cyber triangle"). These are opening points used for activation of the following points to be stimulated: Brainstem, Spleen, Anxiety. All these points have the function of calming the mind and spirit, reducing anxiety and producing analgesia and sedation. The mustard seed (yellow rapeseed) was used for auriculotherapy. The proposed intervention was performed by the researcher, an obstetric nurse and acupuncture specialist. Pregnant women from both control and intervention groups attended four prenatal nursing consultations, but only the intervention group underwent three auriculotherapy sessions at these consultations, with a three-day interval between each session, totaling 13 days of follow-up. The expected response was the presence of sensitivity at the sites of points to be applied and stimulation of the point through the mustard seed attached with microporous, hypoallergenic surgical tape, which were performed by manual manipulation of pregnant women. The survey was performed through instruments such as forms containing sociodemographic and clinical variables, and the State-Trait Anxiety Inventory (STAI) applied by an acupuncture nurse who did not participate in the auriculotherapy-nursing intervention to avoid bias. Descriptive data analysis was performed through frequency tables with number and percentage for each item of the research instruments. A box-plot graph was used for illustration and better visualization of results. The ANOVA was used for comparison of the different moments, and the Student's T for comparison between the case and control groups. The significance level adopted was 5%. The SPSS 20 statistical package was used for analysis.

Results: In the first moment, both groups presented medium level of Trait Anxiety and State Anxiety, and there was no statistical difference between groups, thereby demonstrating the sample homogeneity (p=0.385 and p=0.352). After the auriculotherapy intervention, between the third and fourth consultations, there was a significant reduction of State Anxiety in the intervention group (p=0.033), but the same did not occur in the control group (0.052).

Conclusion: Auriculotherapy is a potential integrative and complementary practice within the National Health System (Brazilian SUS) that can help reduce pregnant women's anxiety during low-risk prenatal care. The acupuncturist nurse has relevant importance in this process.

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Resumo

Objetivo: Avaliar os efeitos da auriculoterapia nos níveis de ansiedade em gestantes atendidas em pré-natal de baixo risco.

Métodos: Trata-se de estudo clínico randomizado, simples-cego, realizado em um ambulatório de pré-natal de baixo risco em uma maternidade filantrópica, no Espírito Santo, Brasil, com amostra de 50 gestantes (25 em grupo controle e 25 em grupo experimental). Utilizou-se como intervenção a auriculoterapia da Medicina Tradicional Chinesa, que é uma das práticas utilizadas como acupuntura de microssistema. Para o tratamento com auriculoterapia, utilizou-se pontos do pavilhão auricular sendo respectivamente: Triângulo Cibernético (Shen Men, Rim e Simpático), que são caracterizados como pontos de abertura, usados para ativar os pontos a serem estimulados: Tronco Cerebral, Baço, Ansiedade. O conjunto desses pontos tem a função de acalmar a mente e o espírito, reduzir a ansiedade, bem como produzir analgesia e sedação. O tipo de semente utilizada na auriculoterapia foi mostarda amarela–colza. A intervenção proposta foi realizada pelo pesquisador, enfermeiro obstetra, especialista em acupuntura. Gestantes de ambos grupos, controle e intervenção, participaram de quatro consultas de enfermagem em pré-natal, porém somente o grupo intervenção foi submetido a três sessões de auriculoterapia nessas consultas, com intervalo de três dias entre cada sessão, totalizando 13 dias de acompanhamento. A resposta esperada foi a presença de sensibilidade nos locais dos pontos a serem aplicados; e a estimulação das sementes de colza, adesivadas com fita cirúrgica microporosa e hipoalergênica, foram realizadas pela manipulação manual da gestante. Levantamento através de instrumentos como formulários contendo as variáveis sociodemográficas e clínicas, e o Inventário de Traço e Estado de Ansiedade (IDATE) aplicado por enfermeira especialista em acupuntura, não tendo participação na intervenção de Enfermagem-auriculoterapia, para se evitar o viés do estudo. Realizou-se a análise descritiva dos dados, através de tabelas de frequência com número e percentual para cada um dos itens dos instrumentos de pesquisa e utilizou-se gráfico *box-plot* para ilustração e melhor visualização dos resultados. O ANOVA foi utilizado para comparação dos diferentes momentos, e o t *Student* para comparação entre os grupos caso e controle. O grau de significância adotado foi de 5%. O pacote estatístico SPSS 20 foi utilizado para análise.

Resultados: No primeiro momento ambos os grupos apresentaram Traço de Ansiedade e Estado de Ansiedade em nível médio, não houve diferença estatística entre os grupos, o que evidenciou homogeneidade da amostra (p=0,385 e p=0,352, respectivamente); após a intervenção com auriculoterapia houve uma redução significante do Estado de Ansiedade do grupo intervenção (p=0,033) entre a terceira e quarta consulta, o mesmo não ocorreu no grupo controle (0,052).

Conclusão: A auriculoterapia pode ajudar a diminuir a ansiedade em gestantes durante o pré-natal de baixo risco, sendo uma prática integrativa e complementar em potencial no âmbito do Sistema Único de Saúde, tendo o enfermeiro acupunturista relevante importância nesse processo.

Resumen

Objetivo: Analizar los efectos de la auriculoterapia en los niveles de ansiedad de mujeres embarazadas en la atención prenatal de bajo riesgo.

Métodos: Se trata de un ensayo clínico aleatorizado, simple ciego, realizado en consultorios externos de atención prenatal de bajo riesgo en una maternidad filantrópica, en el estado de Espírito Santo, Brasil, con una muestra de 50 mujeres embarazadas (25 en grupo de control y 25 en grupo experimental). Se utilizó como intervención la auriculoterapia de la Medicina Tradicional China, que es una de las prácticas utilizadas como acupuntura del microsistema. Para el tratamiento con auriculoterapia, se utilizaron los siguientes puntos del pabellón auricular: Triángulo Cibernético (shenmen, riñón y sistema autónomo simpático), que se caracterizan como puntos de apertura, utilizados para activar los puntos que serán estimulados posteriormente: tronco cerebral, bazo y ansiedad. El conjunto de estos puntos tiene la función de calmar la mente y el espíritu, reducir la ansiedad, así como también producir analgesia y sedación. El tipo de semilla utilizado en la auriculoterapia fue mostaza amarilla o colza. La intervención propuesta fue realizada por el investigador, enfermero obstetra, especialista en acupuntura. Las mujeres embarazadas de ambos grupos, el de control y el experimental, asistieron a cuatro consultas de enfermería en atención prenatal, pero solo el grupo experimental recibió tres sesiones de auriculoterapia en esas consultas, con un intervalo de tres días entre cada sesión y un total de 13 días de seguimiento. La respuesta esperada fue la presencia de sensibilidad en los lugares de los puntos que serían aplicados. La estimulación de las semillas de colza, pegadas con cinta quirúrgica microporosa e hipoalergénica, fue realizada mediante la manipulación manual de la mujer embarazada. La recopilación se realizó a través de instrumentos como formularios con variables sociodemográficas y clínicas y el Cuestionario de Ansiedad Estado Rasgo (IDATE) aplicado por enfermera especialista en acupuntura, sin participación en la intervención de enfermería-auriculoterapia, para evitar el sesgo del estudio. Se realizó un análisis descriptivo de los datos mediante tablas de frecuencia con número y porcentaje en cada ítem de los instrumentos de investigación y se utilizó un gráfico de caja y bigote para ilustrar y visualizar los resultados. Para comparar los diferentes momentos, se utilizó el ANOVA, y el t de *Student* para comparar el grupo experimental y de control. El nivel de significación adoptado fue de 5%. Se utilizó el paquete estadístico SPSS 20 para el análisis.

Resultados: En el primer momento, ambos grupos presentaron rasgo y estado de ansiedad de nivel medio, no hubo diferencia estadística entre los grupos, lo que demostró homogeneidad de la muestra (p=0,385 y p=0,352 respectivamente). Luego de la intervención con auriculoterapia, hubo una reducción significativa del estado de ansiedad del grupo experimental (p=0,333) entre la tercera y cuarta consulta. Esto no ocurrió en el grupo de control (0,052).

Conclusión: La auriculoterapia puede ayudar a reducir la ansiedad de mujeres embarazadas durante la atención prenatal de bajo riesgo y es una práctica integradora y complementaria con potencial en el contexto del Sistema Único de Salud, proceso en el cual el enfermero acupunturista tiene una gran relevancia.

Introduction

Anxiety is considered a "natural physiological response" that causes symptoms of tachycardia, feelings of widespread fear and fear of impending disaster, tension and restlessness. These symptoms may also be related to diseases such as phobias, panic syndrome, obsessive-compulsive disorders, generalized anxiety, among others.[1]

In pregnancy, anxiety has become a common finding because of the life cycle experienced by women, characterized as a moment of emotional

fragility, hormonal fluctuation and social changes that directly influence their emotional health.[2]

For better understanding the gestational changes and interactions between immune function, endocrine system and psychological state, many studies have been conducted based on psychoneuroimmunology, which highlights two-way communications between the neuroendocrine, neurological and immune systems.[3]

It is estimated that up to 87% of pregnant women seek complementary, alternative medicine (CAM) to deal with their complaints because traditional medicines are not used in these forms of treatment. Many therapies are sought by pregnant women, including massage therapy, vitamin supplements, medicinal plants, relaxation therapies and aromatherapy.[4]

The universe of Traditional Chinese Medicine (TCM) includes practices such as auriculotherapy, which uses the ear as a place of intervention, because it represents the whole human body. This therapy seeks to treat the energy imbalance, which includes anxiety in pregnant women.[5] Its effectiveness and effect are represented by its instantaneous results.[6]

The form of application can be the needling in session, pressure on the points, specific needles in hypoallergenic microporous surgical tape, bloodletting, cupping, moxibustion, and surgical tape with mustard seeds. The latter modality is the most appropriate because it does not present a risk of local infection, since the auricular pavilion is highly vascularized and mostly formed by cartilage.[7]

Through Resolution number 326/2008[8], the Federal Nursing Council, federal autarchy and body responsible for disciplining the nursing practice in Brazil, established and recognized auriculotherapy as a specialty that can be performed by nurses. It should be used in a complementary manner always aimed at health promotion and disease recovery and rehabilitation.

The auriculotherapy-nursing intervention is an Integrative and Complementary Practice in the context of TCM classified as a low cost and easy application procedure. Its practice favors humanized care for pregnant women, since obstetricians and acupuncturist nurses play an important role in prenatal care when using this intervention for reducing anxiety and stress in pregnancy.[9]

In the context of the Brazilian public National Health System (Portuguese acronym: SUS), the opportunity of associating the specializations of acupuncture and obstetric nursing with professional nurses enabled the implementation of this study. The objective was pregnancy centered care, which gave pregnant women the opportunity to experience the auriculotherapy-nursing intervention and ensured the integrality of care and totality of human beings in their various life cycles and provided their mental-organic/structural-emotional balance in a humanized and scientific-based way.

Given the above, the aim of the present study was to evaluate the effects of auriculotherapy on anxiety levels of pregnant women receiving low-risk prenatal care.

Methods

This is a randomized, single-blind clinical study conducted at a low-risk prenatal clinic in a philanthropic maternity hospital in the state of Espírito Santo, Brazil. Statistical calculation was performed to determine the sample size, and the following parameters were adopted: power of 80.0%, $\alpha = 0.05$ and difference between groups (40.0%). The calculation resulted in a sample of 50 pregnant women, 25 in the control group and 25 in the intervention group. The groups were randomly constituted by prior draw through a statistical program. Pregnant women who had the following characteristics were included: residents of Grande Vitória; aged between 18 and 42 years old; at any gestational age; aware of and in agreement with the study; and who signed the Informed Consent form. Pregnant women with a history of high-risk pregnancy, with dermatological problems, who had already undergone auriculotherapy, with severe psychiatric disorders or illicit drug users were excluded. The interview technique applied included making records in a form contain-

ing sociodemographic and clinical-obstetric variables. For assessment of anxiety state and anxiety trait, was used the State-Trait Anxiety Inventory (STAI) developed by Spielberger, Gorsuch and Lushene (1970), translated and adapted to Brazil by Biaggio and Natalício (1979).[10] It was applied by an acupuncture specialist nurse, who did not participate in the auriculotherapy-nursing intervention to avoid bias.

This inventory (STAI) has a scale that assesses anxiety as a state (STAI-S), i.e., reflects a transient reaction, a momentary sensation that can be changed; and another scale that assesses anxiety as a trait (STAI-T), which reflects a more stable aspect of the individual in dealing with life-long anxiety, a personal characteristic inherent in being. The frequency of anxiety trait was analyzed and classified according to four categories, namely: almost always (4), often (3), sometimes (2), almost never (1); while for the anxiety state, available options are: no (1); a little (2), quite (3), totally (4). The score of these items ranges from 20 to 80 points, which may indicate low (20 to 40), medium (40 to 60) and high (60 to 80) anxiety levels.

In both instruments, there are statements in which the scores for analysis are inverted from 1, 2, 3, 4 to 4, 3, 2, 1, which are items 1, 6, 7, 10, 13, 16 and 19 of the Anxiety Trait (STAI-T), and items 1, 2, 5, 8, 10, 11, 15, 16, 19 and 20 of the Anxiety State (STAI-S).[10]

For the auriculotherapy treatment, were used the Shen Men, Kidney and Sympathetic ear points. In Portuguese, when these points are used together, they are called *triângulo cibernético*/"cyber triangle". They are opening points used to activate the following points: Brainstem, Spleen, Anxiety. All these points have the function of calming the mind and spirit, reducing anxiety and producing analgesia and sedation. The mustard seed (yellow-rapeseed) was used in auriculotherapy.[11-13] The proposed intervention was performed by the researcher, an obstetric nurse, acupuncture and electroacupuncture specialist with eight years of clinical experience in TCM. The expected response was the presence of sensitivity at the sites of the points. The stimulation provided by the seed attached with adhesive microporous and hypoallergenic surgical tape was performed by manual manipulation of pregnant women.

Pregnant women from both control and intervention groups participated in four prenatal nursing consultations, but only the intervention group underwent three auriculotherapy sessions. These consultations had a three-day interval between each session, totaling 13 days of follow-up (1st prenatal nursing consultation with STAI application + 1st auriculotherapy session in the intervention group; three-day interval; 2nd prenatal nursing consultation + 2nd auriculotherapy session in the intervention group; three-day interval; 3rd prenatal nursing consultation + 3rd auriculotherapy session in intervention group and assessment with the STAI-S; three-day interval; 4th prenatal nursing consultation and assessment with the STAI-S) . At the end of the first session, was given an explanatory folder with information about the compression technique and the number of times the ear should be stimulated at home by the pregnant woman (ten times a day for approximately ten seconds, but if they felt any discomfort at the point, it should not be stimulated). The aim of the fourth nursing consultation was to assess the state of anxiety of pregnant women in both groups.

Except for the auriculotherapy-nursing intervention, the intervention and control groups underwent the same procedures of prenatal nursing consultations and application of the STAI instrument. All women in the control group who wanted, had the opportunity to receive the treatment (auriculotherapy) after the study development.

In order to avoid the Hawthorne effect, that is, to avoid contamination of control group subjects with those of the intervention group, pregnant women were treated on different days of the week, so they never met.

Information collection and application of instruments started only after approval by the Research Ethics Committee of the Health Center of the Universidade Federal do Espírito Santo/UFES under Opinion number 1.544.310, starting on May 15 and ending on October 10 of the year 2016.

The Microsoft Office Excell 2010 for Windows was used for data registration and organization.

Descriptive analysis was performed through frequency tables with number and percentage. The box-plot graph was used for illustration and better visualization of results. ANOVA was used for comparison of the different moments, and the Student's t test for comparison between the case and control groups. The significance level adopted was 5%. The IBM SPSS 20 statistical package was used for analysis.

Results

Table 1 shows the sample characterization according to sociodemographic variables. The most frequent age group of pregnant women was 18 to 24 years old (36%), which, together with the 25-29 age group represented 62% of the sample. Most (66%)

were married/common-law marriage, schooling of ≥ 9 years (78%), family income of one to two minimum wages (76%), unemployed (38%), evangelical religion (62%) and 90% of them reported having family support.

Table 2 has data related to the clinical-obstetric profile of pregnant women. The menarche of 98% of them was before 15 years of age and 56% had their first sexual relationship after this age; 30% had only one pregnancy and 54% had given birth at least once; 68% had only one living child. Most pregnant women did not report

Table 1. Sociodemographic variables of pregnant women

Characteristics	n(%)
Age range	
18 – 24 years	18(36)
25 – 29 years	13(26)
30 – 34 years	10(20)
35 – 39 years	9(18)
Marital status	
Single	13(26)
Married/Common-law marriage	33(66)
Widow	4(8)
Years of study	
Up to 8 years	11(22)
9 years or more	39(78)
Family income	
Up to 2 minimum wages	38(76)
2 – 4 minimum wages	10(20)
More than 4 minimum wages	1(2)
Did not inform	1(2)
Occupation	
Employed	16(32)
Unemployed	19(38)
Student	3(6)
Housewife	10(20)
Others	2(4)
Belief	
Catholic	15(30)
Evangelical	31(62)
Spiritist	1(2)
More than one religion	1(2)
None	2(4)
Social support	
Family	45(90)
Friends	4(8)
Nobody	1(2)
Total	50(100)

Table 2. Clinical-obstetric profile of pregnant women

Characteristic	n(%)
Age of menarche	
Up to 15 years	49(98)
After 15 years	1(2)
Age of first sexual relationship	
Up to 15 years	22(44)
After 15 years	28(56)
Number of pregnancies	
One	15(30)
Two	16(32)
Three	10(20)
Four or more	9(18)
Parity	
One	27(54)
Two	12(24)
Three or more	4(8)
None	7(14)
Living children	
1 child	34(68)
2 or more children	16(32)
Number of abortions	
None	43(86)
One abortion	6(12)
Two or more abortions	1(2)
Type of delivery	
Normal	19(38)
Cesarean	10(20)
Both	3(6)
None	18(36)
Planned current pregnancy	
Yes	23(46)
No	27(54)
Desired current pregnancy	
Yes	46(92)
No	4(8)
Number of prenatal consultations	
1 consultation	17(34)
2 to 5 consultations	17(34)
6 or more consultations	16(32)
Number of hospitalizations	
None	48(96)
One or more	2(4)
Total	50(100)

abortions (86%); 38% had a normal delivery. Although more than half of women had not planned the pregnancy (54%), the vast majority wanted it (96%). During pregnancy, 96% of pregnant women reported no hospitalizations. The vast majority did not use tobacco (96%) and did not drink alcohol (94%).

Table 3 shows that both groups had medium anxiety level in the Anxiety Trait assessment. There was no statistically significant difference between groups, neither in the Anxiety State at the first appointment (p=0.352), which demonstrated homogeneity (p=0.385). After the auriculotherapy intervention, between the third and fourth consultation, there was a significant reduction in anxiety (p = 0.033) in the intervention group, but the same did not occur in the control group (0.052), which positively reinforces the effectiveness of this integrative and complementary practice (Table 3/Figure 1).

Table 3. Data on pregnant women's anxiety

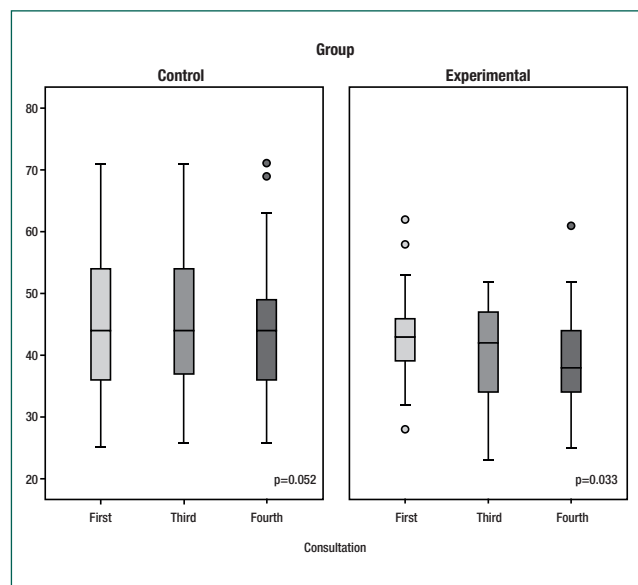| Anxiety	Control	Experimental	p-value
Trait	50±11	47±11	0.385
State			
First moment	46±13	43±8	0.352
Third moment	46±13	41±8	
Fourth moment	44±12	39±9	
p-value	0.052	0.033	

Figure 1. Pregnant women's anxiety level

Discussion

This study showed that auriculotherapy is an effective treatment when used as an intervention aimed at reducing anxiety levels in pregnant women receiving low-risk prenatal care.

The prevalence of mental disorders, such as mood and anxiety affect 20% of women.[14] Obstetric risks involved in the development of a pregnancy put women in a susceptible state to anxiety and make them dual; fragile, for fear of pregnancy changes, and at the same time, happy about the process of conception and formation of a new life.

Anxiety causes endocrine and behavioral changes, such as seeking tobacco, inadequate nutrition, and lack of commitment with prenatal consultations.[15] The higher the level of anxiety during pregnancy, the greater the likelihood of puerperal depression[16] and deleterious effects for both pregnant women and the newborn. In a prospective longitudinal study, was assessed the anxiety in 35 pregnant women. The conclusion was that anxiety exerts influence on the fetal brain morphology that may have regional reductions in associated gray matter. The authors reported the study was pioneer by demonstrating the relation between anxiety and morphological changes in the central nervous system, which leads to intellectual and cognitive impairment in the newborn/child.[17]

Epidemiological studies warn of underreporting of anxiety, either because of women's embarrassment of expressing themselves or because they consider these are "only" transient symptoms related to hormonal changes.[18] Anxiety may be alleviated when the family, friends and partner are included in the gestational process. Pregnant women need people they trust to share fears, anxieties and joys.[19]

The prematurity and low birth weight of newborns of mothers in state of anxiety have been increasing when related to adolescent pregnant women and those over 30 years of age.[20] Hence the interest in advancing research to determine this association that has high prevalence rates in both developing and developed countries.[21]

A study pointed out that women in the postpartum period, both normal delivery and cae-

sarean section, have a medium level of anxiety.[22] In another study, was evaluated the stress and depression in puerperal women in England, and was found that women with a history of prenatal anxiety had anxiety in the third trimester of pregnancy (13%), while in the postpartum period it was identified in only 8.1% of them. Of women with high levels of postpartum anxiety, 64% reported that anxiety was present in the prenatal period.[23]

In an experimental study conducted in Brazil, were evaluated the effects of relaxation on anxiety in postpartum women. The conclusion was that knowing the pregnant woman and her general feelings provides better mental health during pregnancy and reduces postpartum complications both for the mother and newborn.[24]

Integrative practices are constantly advancing among health interventions. They are the preferred choice for treating anxiety disorders, given the lower risks of adverse effects and positive results demonstrated by the significant reduction in anxiety and higher maternal-fetal bonding.[25]

According to the Ministry of Health, these practices should be implemented for reducing pregnant women's anxiety and avoiding more serious postpartum disorders. Auriculotherapy is an Integrative and Complementary Health Practice that may favor the reduction of anxiety.[26]

The limitation of this study was the small number of low-risk pregnant women in the outpatient clinic studied.

Conclusion

The study results support the performance of auriculotherapy. The intervention of acupuncturist health professionals in pregnant women receiving low-risk prenatal consultation proved to be significant in the comparison between the control and intervention groups regarding the reduction of anxiety and highlighted that Traditional Chinese Medicine practice is beneficial for treating the anxiety state during pregnancy. The auriculotherapy practice by a professional nurse was well accepted by pregnant women during prenatal consultations, and by the health system, given its applicability and low cost. There have been numerous advances in CIPs within the SUS, such as technological, political and conceptual, but much effort is still needed to make these interventions accessible to the population. The lack of qualified professionals for TCM practices is a reality of the SUS, and this is a structural and organizational problem of primary health care.

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Collaborations

Silva HL, Almeida MVS, Diniz JSP, Leite FMC, Moura MAV, Bringuente MEO, Brandão-Souza C and Amorim MHC contributed to the study design, analysis and interpretation of data, article writing, relevant critical review of intellectual content and approval of the final version to be published.

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