

## Effect of Chinese auriculotherapy on the mood of health professionals: A pilot study

Efeito da auriculoterapia chinesa sobre o humor de profissionais de saúde: estudo piloto

Efecto de la auriculoterapia china sobre el humor de los profesionales sanitarios: estudio piloto

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**Abstract: Objective:** to verify the effectiveness of an auriculotherapy protocol for reducing signs and symptoms of stress in improving the mood of health professionals. **Method:** a controlled and randomized pilot study with two groups of 40 participants each, intervention and control, carried out in an oncology hospital. **Inclusion criteria:** working for at least one year in the hospital and a score of 40 to 150 on the Stress Symptoms List. All participants answered the biosociodemographic questionnaire and the Brunel Mood Scale (BRUMS) before and after the study. The intervention consisted of six auriculotherapy sessions, and the control group did not receive treatment. **Results:** a mean age of 36.5 years, 50.0% single, 57.5% with children, 33.7% nurses, and mean time in their institution was 59.1 months. There was a significant decrease in the overall score and in the BRUMS mental confusion and tension (<0.05) domains. **Conclusion:** the auriculotherapy protocol improved the mood of nursing professionals.

**Descriptors:** Auriculotherapy; Complementary Therapies; Health Personnel; Affect; Occupational Stress

**Resumo: Objetivo:** verificar a efetividade de um protocolo de auriculoterapia para redução de sinais e sintomas de estresse na melhora do humor dos profissionais de saúde. **Método:** estudo piloto controlado e randomizado, com dois grupos de 40 participantes cada, intervenção e controle, realizado em hospital oncológico. Critérios de inclusão: atuar há pelo menos um ano no hospital e escore de 40 a 150 na Lista de Sintomas de Stress. Todos os participantes responderam ao questionário biosociodemográfico e a Escala de Humor de Brunel (BRUMS) antes e depois do estudo. A intervenção consistiu de seis sessões de auriculoterapia e o controle sem tratamento. **Resultados:** idade média 36,5 anos, 50,0% solteiras, 57,5% com filhos, 33,7% enfermeiras, tempo médio de instituição

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59,1 meses. Houve diminuição significativa no escore global e nos domínios confusão mental e tensão (<0,05) da BRUMS. **Conclusão:** o protocolo de auriculoterapia melhorou o humor dos profissionais de enfermagem.

**Descritores:** Auriculoterapia; Terapias Complementares; Profissionais de Saúde; Humor; Estresse Ocupacional

**Resumen: Objetivo:** comprobar la eficacia de un protocolo de auriculoterapia para reducir los signos y síntomas del estrés, con el intuito de mejorar el estado de ánimo de los profesionales sanitarios. **Método:** Se trata de un estudio piloto controlado y randomizado, llevado a cabo en un hospital oncológico entre dos grupos de 40 participantes cada uno, intervención y control. Los criterios de inclusión eran: haber trabajado en el hospital durante al menos un año y haber obtenido una puntuación entre 40 y 150 en la Lista de Síntomas de Estrés. Todos los participantes respondieron al cuestionario biosociodemográfico y a la Escala de Humor de Brunel (BRUMS) antes y después del estudio. La intervención consistió en seis sesiones de auriculoterapia y el control sin tratamiento. **Resultados:** La edad promedio era de 36,5 años, el 50,0% era soltera, el 33,7%, enfermera, el 57,5% tenía hijos, el tiempo medio transcurrido en la institución, 59,1 meses. Hubo una disminución significativa en la puntuación global y en los dominios de confusión mental y tensión (<0,05) de la BRUMS. **Conclusión:** el protocolo de auriculoterapia mejoró el humor de los profesionales de enfermería.

**Descriptor:** Auriculoterapia; Terapias Complementarias; Personal de Salud; Humor; Estrés Laboral

## Introduction

People spend a large part of their lives in work environments, which according to their characteristics can contribute to the process of becoming ill. Nursing professionals need to deal with several stressors during their workday, such as a long shift, the shift change, the emotional aspects involved in caring for sick people, among other physical and psychosocioemotional loads. Inadequate stress management can have a negative impact on mood, resulting in depression, fatigue, dissatisfaction with work, less commitment to the institution, and intention to leave the job, leading the professional to burnout or other physical and psychological illnesses.<sup>1</sup> Stress has also been related to poor sleep, which impairs subjective mood, understood as the state of mind, by altering the functional connections of the amygdala, the center of emotional control.<sup>2</sup>

A systematic review on burnout in oncology nurses found 3% to 38% of the population samples suffering from severe emotional exhaustion, while 46% to 84% of them had moderate emotional exhaustion.<sup>3</sup> A study on nursing work exhaustion in a teaching hospital in Rio Grande do Sul observed that 2.1% of sick leave due to health problems were related to exposure

to psychological loads, mainly represented by depression and suffering from excessive activities at work, with 12.1% of notifications due to mental disorders.<sup>4</sup> The concern with psycho-emotional exhaustion lies in the fact that it goes unnoticed, and by the time a worker seeks help to solve their problem, the mental disorder has already set in.

Shift work has also been related to occurrences of stress, depression, absenteeism, and dissatisfaction in the work environment, although a study on the mood status of nurses in the neonatal intensive care unit did not show any difference between the day and night shifts at the beginning of the work duty, as assessed by the Brunel mood scale (BRUMS) in its six domains: tension, fatigue, depression, anger, mental confusion, and vigor. Despite this, the following factors were observed: those who slept well had less tension and fatigue, and greater vigor; those with good quality of life had less depression and anxiety, and greater vigor; and those who were married or single had lower scores of mental confusion and tension than those who were divorced.<sup>5</sup>

Mood is a factor which influences the way people deal with stress, facilitating their approach to face situations experienced in daily life. It produces an impact which varies from depression and anxiety to the appearance of cardiovascular diseases, in addition to influencing psychological resistance, cognitive performance, aging and longevity,<sup>6</sup> sociability and coping with the demands of the environment.<sup>7</sup>

There is no consensus on the definition of mood, which permeates discussions about emotions and happiness.<sup>7</sup> It can be understood as a psychological state that presents positive and negative feelings which vary in intensity and duration, being an indicator of general psychological well-being.<sup>8</sup> Mood would be distinguished from emotions in that it is longer lasting and not attributable to a particular event. There is evidence that good mood is related to the human being's tendency to feel good and interested in daily activities; on the other hand, a lack of interest in these activities is related to bad mood.<sup>7</sup>

Given the frequency which signs and symptoms of stress are observed in health professionals, non-pharmacological interventions that contribute to well-being are beneficial. The use of Integrative and Complementary Practices (ICPs) in health to assist in comprehensive care for people has grown significantly and has been legitimized by society in recent years. Interventions with ICPs have been shown to be effective in reducing signs and symptoms of stress.<sup>9-11</sup> In addition to improving the well-being and quality of life of professionals, these health practices also have a positive impact on the work process of nursing, reducing the risks of undesirable events related to patient safety.<sup>12</sup>

Chinese auriculotherapy stands out among ICPs for both its effectiveness and for the speed which it can be applied. It is an ancient Acupuncture technique which uses the ear to perform health treatments, taking advantage of the reflex that the ear has on the central nervous system in order to trigger a systemic effect on the other organs and regions of the body. The application of auriculotherapy has shown significant results in reducing stress levels in the nursing team within the hospital context.<sup>12</sup>

Considering the importance of good mood in coping with everyday situations and the presence of negative mood states in stressed people, this study had the following hypothesis: “An auriculotherapy protocol for reducing stress signs and symptoms is effective in improving the mood of nursing professionals”. Therefore, this study aims to verify the effectiveness of an auriculotherapy protocol to reduce signs and symptoms of stress in improving the mood of health professionals.

## **Method**

This is a controlled and randomized pilot study with two parallel arms constituted by an intervention group (IG) and control group (CG), carried out in a large public teaching hospital of tertiary healthcare from September/2017 to October/2018. The hospital is specialized in

oncology and attends adults and older adults in the city of São Paulo. The nursing care team consists of approximately 1,650 professionals.

The study population consisted of professionals from the nursing staff who met the following inclusion criteria: working for at least one year at the institution, presenting a score on the Stress Symptom List (LSS)<sup>13</sup> from 40 to 150 points corresponding to moderate to high levels of stress, having availability to attend sessions, and having reported an episode of insomnia or sleep disturbance at least once a week to the researcher. Exclusion criteria were as follows: simultaneously using some kind of complementary practice or herbal medicines, and individuals with chronic kidney stones, as the kidney point may precipitate movement of the stones. Participants with other health problems or using medications were not excluded, as auriculotherapy is considered a complementary practice, therefore it is important to evaluate its effect in real situations.

A convenience sample of 80 participants was established. As there was a greater number of eligible candidates, randomization was performed for 105 participants considering the possibility of losses during the study. Since the loss was higher than the established convenience sample, a partial crossover was carried out with the participants in the control group, who were again recruited, evaluated and randomized to the study groups after ending their initial participation in the study.

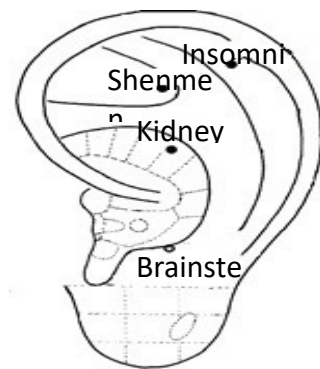
The 1:1 randomization was performed in the Research Randomizer program, available at the website: <http://www.randomizer.org/form.htm>. This was performed by one of the authors by creating a sequential numerical list: the first participant was randomly chosen and the rest were included in the list as they met the eligibility criteria and according to the randomized list.

**Data collection instruments.** The LSS was applied to identify participants with moderate to high stress levels. It is composed of 59 psychophysiological and psychosocial symptoms of stress used to indicate the presence and frequency of each symptom through a Likert response option (0 to 3). The scale score is given by the sum of the values assigned to each item, which

can vary from 0 to 177,<sup>13</sup> in which the higher the score, the greater the perception of signs and symptoms of stress. A questionnaire regarding sociodemographic data (gender, age, marital status, education, basic illnesses, smoking, use of medications, anxiolytics or antidepressants, alcohol, pregnancy and lithiasis) and occupational data (unit, professional category, having more than one job, shift and working time) was also applied.

The mood assessment was carried out using the BRUMS instrument validated for Portuguese.<sup>14</sup> BRUMS is a reduced version adapted from the Profile of Mood State (POMS) post-validation in adults and consists of 24 items on a Likert scale (0 to 4), which allows the person to position themselves in relation to how they feel at the moment. These items comprise six domains: tension (state of musculoskeletal tension and worry), fatigue (state of tiredness and low energy), anger (state of hostility towards others), depression (emotional state of discouragement, sadness and unhappiness), vigor (state of energy and physical vigor) and mental confusion (state of dizziness and instability in emotions). The total score ranges from 0 to 96, and each domain from 0 to 16, so that the higher the score, the greater the manifestation of the respective mood state.

**Intervention.** Auriculotherapy was applied using radionic crystals at the Shenmen, Brainstem and Kidney points according to an ear-point protocol previously tested in a hospital's nursing team for stress reduction,<sup>12</sup> in addition to the point associated with insomnia (Figure 1). Six sessions were held, one per week, for six weeks. The sessions lasted from five to ten minutes each.



**Figure 1** - Ear point protocol for stress. São Paulo, Brazil, 2017-2018.

After the appropriate location of the reactive points on the ear surface with a hand-held probe, antiseptics were performed with 70% ethyl alcohol on the ear and radionic crystals were applied to stimulate the points fixed with non-allergenic adhesive tape. The radionic crystals remained in place for up to six days, with removal at least one day before the next session. Participants were instructed to remove the crystals early if there was any discomfort, itching or signs of allergy. In this case, or in case of the adhesive tape loosening, it would not be necessary to replace the crystals until the next session. Participants were instructed to press the points three times a day, 15 times. The points were again applied in each session to the ear opposite to the previous session. The interventions were carried out by four nursing students who attended the Basic module of the Chinese Auriculotherapy Course trained under the supervision of an experienced acupuncturist.

The CG did not receive any intervention, and the participants filled out the instruments at the same time as the IG, including the LSS, a biosociodemographic questionnaire to identify eligible participants and the BRUMS scale.

**Outcome.** The improvement in mood as assessed by the BRUMS instrument was considered as the main outcome.

**Collection procedures.** Recruitment was carried out through dissemination with leaflets and brief meetings with employees in each work sector during their shift change. Volunteers

who met the inclusion criteria screened by the LSS and the biosociodemographic questionnaire were allocated to the IG or CC study groups according to the randomization list. Some participants abandoned the sessions during the study due to the dynamics of shift work and turnover, being considered losses. The control group participants in the study were replaced (partial crossover) with a minimum washout of 30 days to reach the established sample number with a new eligibility and randomization assessment. IG participants were not included in the crossover due to a lack of knowledge about the duration of the effects of auriculotherapy. The sessions were held in a room in the participant's own work sector, with the BRUMS being applied by those who performed the intervention. Participants in both groups responded to the BRUMS at the beginning of the study and after six weeks.

**Statistical analysis.** The information was entered into an excel spreadsheet shared on the google drive by those who applied the instruments, and were verified later. The sample with replacement was considered for the descriptive analysis ( $n = 80$ ). Relative and absolute frequencies were used for qualitative variables. The BRUMS overall score was calculated as follows: [(tension+depression+anger+fatigue+mental confusion) - vigor]. Central tendency and variability measures were used for quantitative measures; Cronbach's alpha coefficient was used to analyze the internal consistency of BRUMS. The chi-squared test and student's t-test were used to test the homogeneity of the study groups; in addition, the mixed effects ANOVA model was used to analyze the intervention's effectiveness and the influence of the variables gender, age, education, use of anxiolytics/antidepressants, use of alcohol, use of medications and thyroid problems in the outcome. The normality of the distribution was verified by the Kolmogorov-Smirnov test. The significance level was set at 5%. The Cohen's d test was used to analyze the effect size. The values for interpreting the effect sizes were: insignificant ( $<0.19$ ), small ( $0.20 - 0.49$ ), medium ( $0.50 - 0.79$ ), large ( $0.80 - 1.29$ ) and very large ( $> 1.30$ ). The values used to interpret the percentage of change were: enormous reduction ( $> 75$ ), very large reduction ( $50 \leq r < 75$ ), large

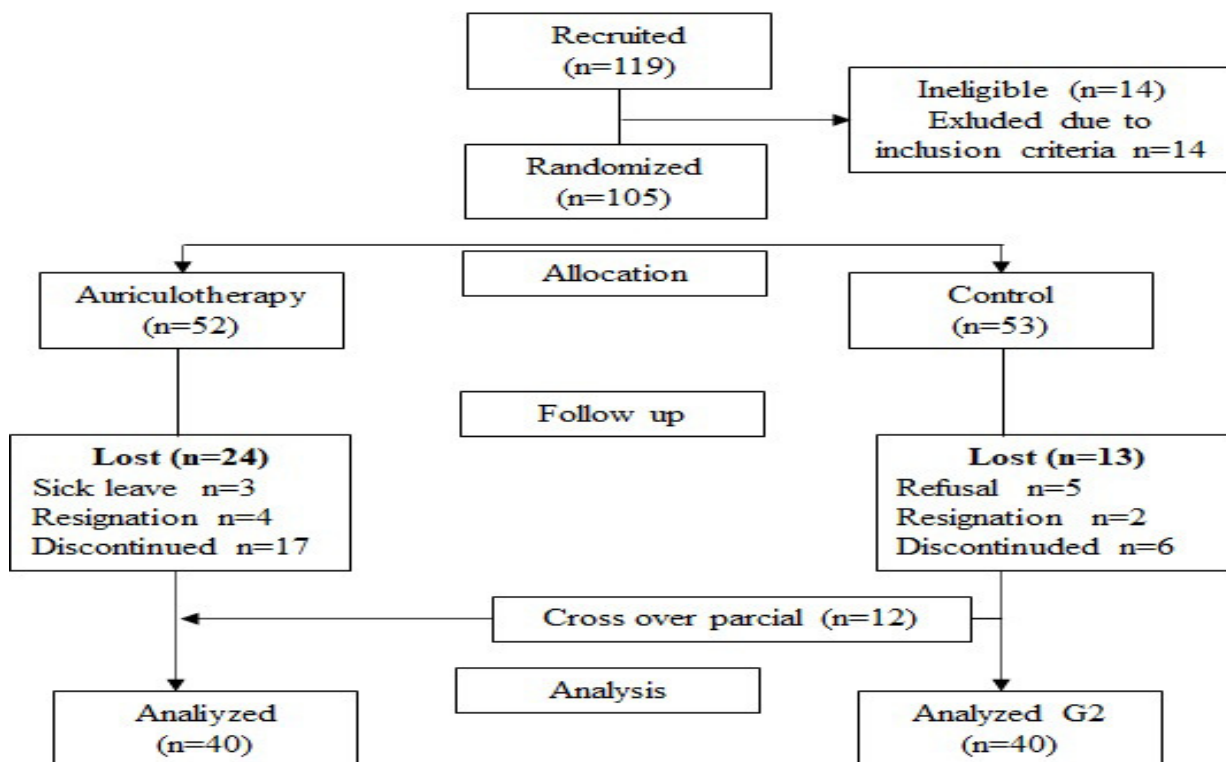


reduction ( $30 \leq r < 50$ ), medium reduction ( $15 \leq r < 30$ ), small reduction ( $5 \leq r < 15$ ) and insignificant change ( $< 5$ ).<sup>15</sup> The analysis was performed by a statistician who used the R® v.4.0.4 software program.

**Ethical aspects.** The study complied with the Regulatory Guidelines and Norms for Research Involving Human Beings (Resolution CNS 466/12). The participants signed the Free and Informed Consent Form and the CG received the auriculotherapy treatment after the end of the study. The research project was approved by the Research Ethics Committee of the University of São Paulo School of Nursing (opinion No. 1,969,805), approved on March 17, 2017, and by the co-participant institution (opinion No. 1,976,922), approved on March 22, 2017. There was no report of discomfort or local injury. The present study presents the results related to the BRUMS instrument.

## Results

With institutional and individual disclosure, 119 professionals expressed interest in participating in the study and 105 met the inclusion/exclusion criteria. The mean stress score for the LSS was 82.6 (SD  $\pm$  27.1), with a median of 77.5 (range 40 to 148). There were losses during the study due to dismissal, vacation, leave or withdrawal. Figure 2 shows the allocation and conduct flowchart of the controlled and randomized pilot study with partial crossover of the control group.



**Figure 2** - Allocation flowchart of research subjects. São Paulo, Brazil, 2018.

Participants worked in different sectors: inpatient units, intensive care units, surgical center, material and sterilization center, outpatient clinics, chemotherapy and radiotherapy units, day hospital, emergency care, continuing education and clinical research. The average age of the participants was  $37.2 (\pm 8.5)$  years in the CG, and  $35.8 (\pm 7.4)$  years in the IG ( $p = 0.425$ ). The mean number of children was  $1.0 (\pm 0.92)$  in the CG and  $0.9 (\pm 1.0)$  in the IG ( $p = 0.422$ ). The participants had worked at the institution for an average of almost five years, with  $59.9 (\pm 50.1)$  months in the CG and  $59.8 (\pm 47.2)$  months in the IG ( $p = 0.993$ ); the median in both groups was 48 months and ranged from 3 to 240 months for the CG and 6 to 240 months for the IG. The median with regard to working hours in the CG was 8 hours, while in the IG it was 6 hours ( $p = 0.581$ ).

Almost all of the participants were female (92.5%), with a greater participation of nursing technicians and nurses in both groups, and the total percentage of auxiliary nurses was 3.8% ( $n = 3$ ). The groups were homogeneous for the biosociodemographic and professional variables (Table 1).

**Table 1** - Qualitative biosociodemographic variables according to study groups and p-value by the chi-squared test (IG n=40; CG n=40). São Paulo, Brazil, 2017-2018.

Variable	Categories	Control		Intervention		p-value
		n	%	n	%	
Gender	Female	39	97.5	39	97.5	0.753
	Male	1	2.5	1	2.5	
Children	No	15	37.5	19	47.5	0.2498
	Yes	25	62.5	21	52.5	
Marital status	Married	16	40.0	16	40.0	0.741
	Divorced	5	15.5	3	7.5	
	Not married	19	47.5	21	52.5	
Education	Complete high school	29	72.5	21	52.5	0.160
	Incomplete higher education	1	2.5	3	7.5	
	Graduated	10	25.0	16	40.0	
Profession	Auxiliary / Technician	21	52.5	19	47.5	0.424
	Nurse	11	27.5	16	40.0	
	Scrub nurse	8	20.0	5	12.5	
Medication	No	27	67.5	24	60.0	0.321
	Yes	13	32.5	16	40.0	
Anxiolytic	No	34	85.0	28	70.0	0.090
	Yes	6	15.0	12	30.0	
Other job	No	37	92.5	33	82.5	0.155
	Yes	3	7.5	7	17.5	
Baseline disease	No	28	70.0	29	72.5	0.500
	Yes	12	30.0	11	27.5	
Smoking	No	34	85.0	33	82.5	0.500
	Yes	6	15.0	7	17.5	
Alcohol	No	28	70.0	26	65.0	0.406*
	Yes	12	30.0	14	35.0	
Work sector	Surgery Center	16	40.0	18	45.0	0.790
	Inpatient care unit	11	27.5	9	22.5	
	Outpatient / day hospital	10	25.0	8	20.0	
	Others*	3	7.5	5	12.5	

\* material and sterilization center, emergency care, continuing education and clinical research.

The main health problems mentioned were hypertension (n = 9; 11.3%) and altered thyroid function (n = 7; 8.8%), with anxiety/depression (n = 2; 2.5%) also being mentioned, hypercholesterolemia (n = 2; 2.5%), endometriosis (n = 1; 1.3%), asthma (n = 1; 1.3%), supraventricular tachycardia (n = 1; 1.3%), alcoholism (n = 1; 1.3%) and scoliosis (n = 1; 1.3%). A total of 33.3% (n = 29) of the participants used some medication, with emphasis on 22.5% (n = 18) who used antidepressants/anxiolytics (sertraline, fluoxetine or venlafaxine hydrochloride, citalopram hydrobromide), 15.0% (n = 12) were smokers, and 52.5% (n = 42) drank alcohol socially, except for one reference to alcoholism. There was only one mention of anxiety and depression in each study group, although the number of participants using anxiolytics/antidepressants was higher and prevalent in the category of nurses. There was also no difference between groups for these variables ( $p > 0.05$ ).

Cronbach's alpha of the BRUMS instrument for the overall score was 0.914, being 0.645 for tension, 0.850 for depression, 0.845 for anger, 0.715 for vigor, 0.834 for fatigue and 0.766 for mental confusion domain. A comparative analysis was carried out between the sociodemographic data of the study population and the overall BRUMS score in order to find out if these characteristics influenced the mood state. This analysis showed that only the variable education was related to the highest score: in total ( $p = 0.014$ ) and in the domains of tension ( $p = 0.004$ ), anger ( $p = 0.003$ ) and fatigue ( $p = 0.029$ ), regardless of the group.

The overall BRUMS score decreased significantly after six weeks of auriculotherapy for the IG when compared to the CG ( $p = 0.0017$ ), as well as for tension ( $p = 0.0183$ ) and mental confusion ( $p = 0.0016$ ) (Table 2). The domains which had a greater intragroup reduction in IG after six weeks were tension ( $p = 0.0183$ ), depression ( $p = 0.0236$ ) and mental confusion ( $p = 0.0016$ ).

Some variables that could influence the outcome were included in the mixed effects analysis model. In this sense, it was observed that there was no interference due to the fact that some participants had thyroid changes, used drugs, antidepressants/anxiolytics or alcohol,

either in the total BRUMS score or in their domains ( $p>0.05$ ). The effect size by Cohen's  $d$  between the groups was moderate, being 0.41 for the overall score with a relative improvement of 17%; 0.49 for tension with an improvement of 24%; and 0.45 for mental confusion with an improvement of 28%.

**Table 2** - Means and standard deviation in the auriculotherapy study groups before and after the intervention according to the BRUMS instrument and domains;  $p$ -values of the analysis by the mixed effects model. São Paulo, Brazil, 2017-2018.

Variables	Before		After		Group-time*	time <sup>†</sup>	group <sup>‡</sup>
	Mean	SD±	mean	SD±			
<b>BRUMS – Total</b>							
IG	44.0	16.4	32.7	15.8	0.0017	<0.001	0.203
CG	44.2	15.7	39.3	17.0			
<b>Anger</b>							
IG	5.52	4.43	3.72	3.55	0.4035	0.0798	0.6818
CG	5.9	3.8	4.82	4.5			
<b>Tension</b>							
IG	7.42	3.71	5.03	3.25	0.0183	0.1918	0.8979
CG	7.32	3.54	6.65	3.44			
<b>Depression</b>							
IG	6.48	3.83	4.38	3.89	0.2763	0.0236	0.912
CG	6.38	4.32	5.12	4.13			
<b>Fatigue</b>							
IG	9.6	4.33	6.8	4.56	0.093	0.0646	0.4928
CG	10.2	4.06	9.02	3.98			
<b>Mental confusion</b>							
IG	5.08	3.87	3.4	2.75	0.0016	0.5281	0.3921
CG	4.45	3.16	4.72	3.19			
<b>Vigor</b>							
IG	9.88	2.78	9.38	2.25	0.5307	0.0536	1.0000
CG	9.88	3.16	8.95	2.54			

\* Interaction between the study group and time; <sup>†</sup> Behavior over time; <sup>‡</sup> Behavior in the group.

Even with a significant difference between the groups in the analysis of the time effect, it was observed that there was an intragroup difference ( $p<0.05$ ) for both the IG and the CG in the overall BRUMS score and in the depression domain, although the percentage of improvement

was greater in the IG. According to Cohen's *d*, the effect size on the IG was moderate for the overall BRUMS score of 0.71 with 26% improvement in mood, and 0.55 for the depression domain with 32% improvement. According to Cohen's *d*, the effect size in the CG was small for the overall BRUMS score of 0.3 with 11% improvement in mood, and 0.3 for the depression domain with 20% improvement.

## Discussion

High stress can act on different dimensions of well-being. The work demand for nurses predisposes them to develop depression, promoting difficulty in developing cognitive and interpersonal activities, along with mood changes and loss of concentration, resulting in risks of accidents and a drop in productivity. A person who experiences depressed mood shows loss of interest, pleasure, energy, and may show signs of anxiety and sleep disturbance.<sup>16</sup> Mood is subjective and difficult to measure, and the BRUMS is therefore divided into domains such as sensations of anger, disposition, nervousness and dissatisfaction, which are perceptible by the individual being evaluated.<sup>14</sup>

This study used four auriculotherapy points in the ear as a form of non-pharmacological intervention, of which three (Shenmen, Brainstem and Kidney) have already shown beneficial results in reducing stress in groups that used needles<sup>12,17</sup> or mustard seeds.<sup>12</sup> In addition, the insomnia point was added because depressed moods and sadness compromise sleep quality.<sup>18</sup> Studies in other clinical situations have also observed good results with the use of the Shenmen point. Due to its calming and analgesic properties, it has been used to reduce anxiety during labor,<sup>19</sup> and the Kidney and Shenmen points were part of a protocol to reduce insomnia in menopausal women.<sup>20</sup>

The protocol using radionic crystals showed improvement in mood as assessed by the overall BRUMS score and by the mental confusion domain between the groups. There was an

improvement in the depression domain in both groups, although the effect size was greater in the IG. The overall BRUMS score after six weeks was lower for the IG compared to the CG, showing the positive effect that the therapy had on these professionals in the analyzed time period. Favorable conditions are offered by balancing energy levels by stimulating points in microsystems such as the ear, so that there is a change in the individual's social, emotional, physical, mental and spiritual behavior patterns.<sup>12</sup>

There was a decrease in the mean score observed in the anger domain for the IG, but this reduction was not significant enough to overcome the decrease also seen in the CG. Anger and irritability represent behavioral experiences of negative emotions observed in mood, but also in situations of anxiety disorders, post-traumatic stress, bipolar disorder, and in persistent negative emotional states, among others.<sup>21</sup> Thus, the addition of Nogier and Bahr's aggressiveness point to the protocol is indicated for a more significant reduction of such symptoms.<sup>22</sup>

On the other hand, the tension domain showed relief effects due to the relaxing effect of the Shenmen point. Nurses in oncology units are often exposed to situations of tension and anxiety due to the criticality of patients, demands from family members, situations of fear, lack of preparation to practice their specialization and work overload,<sup>3</sup> in addition to possible frustration due to poorly resolved actions in controlling signs and symptoms in patients with severe distress.

Mental fatigue is a psychobiological state caused by prolonged periods of demand for cognitive activity, and characterized by feelings of tiredness and lack of energy.<sup>23</sup> Although sleep is a way to restore vitality, the protocol did not show significant effects to act on the mood state related to fatigue and vigor.

Working with degenerative diseases requires a lot of resilience from professionals to cope with the constant suffering of patients (and family members) who have a disease which brings them closer to the experience of death. The professionals who participated in this study work in a specialized hospital, and taking care of cancer patients is delicate and increases the emotional

burden present in the work environment even more. A study which evaluated emotional impact and compassion fatigue in cancer nurses observed that 62.6% had moderate burnout scores and 51.7% moderate anxiety state.<sup>24</sup> The term “compassion fatigue” has been used to describe a state with psychological, physiological and social signs and symptoms caused by the health professional’s unhealthy emotional commitment to the suffering of other people caused by empathy for the suffering of the other. This state of stress is defined by a lack of enthusiasm, sadness, irritability and exhaustion,<sup>24</sup> which characterize the negative aspects of mood.

The measurement of mental fatigue in nursing professionals presented in this study is important, considering that this sign directly reflects the professional’s work performance, with a consequent increase in the risk of accidents. It is known that high levels of fatigue culminate in lags in the state of alertness and vigilance, which can be related to mental confusion,<sup>25</sup> one of the domains which showed a reduction after the intervention.

The only variable which interfered with the score was education, in which individuals with complete higher education had a better mood, probably due to less tension, anger and fatigue than those who had only completed high school, and mainly consisting of technical professionals. This difference can be justified by the social division of nursing work, in which the nurse historically has a role focused on management, while technical level professionals dedicate more time to care with the patient, which is sometimes physically exhausting, leaving them more prone to accidents at work resulting from care.<sup>26</sup>

Stressors influence mood, but the change in mood will depend on the individual’s temperament characteristics, coping strategies, degree of overload and how they respond to these situations. Mood states can fluctuate such as in alcohol consumption, exacerbating negative states, especially in hangovers,<sup>27</sup> and in health problems such as hypothyroidism and depression.<sup>28</sup> However, these variables did not compromise the outcome obtained in this study.



BRUMS is an efficient scale which could be used as a tool for assessing mental health, since the therapeutic significance of the six domains is well established.<sup>29</sup> Assessing the mood profile of professionals in the hospital environment (the focus of the present study) undergoing the auriculotherapy intervention using BRUMS proved to be pertinent, which could be extended in future studies to assess mood, and relating it to the wear and tear that work in the hospital environment causes.

The improvement in the mood levels of nursing professionals mainly observed in the tension and mental confusion domains, not only impacts improving resilience to deal with problems at work, but also on the nurse-patient relationship, creating a more harmonious and relaxing environment for professionals and users of the service, as well as for the team in general. Both auriculotherapy techniques were effective in a study<sup>12</sup> carried out with nursing professionals in which the effectiveness of auriculotherapy application with needles and mustard seeds was compared in reducing stress and improving coping, but no evidence was found in the literature defining the effectiveness of auriculotherapy with radionic crystals. Based on the results, the present study demonstrated that the application of these microspheres improved the mood of nursing professionals. The use of this type of material seems advantageous when compared to using seeds, as it does not require the individual to do a toning or sedation stimulus.

This study had some limitations, such as the non-use of sealed envelopes in distributing the participants after randomization, as well as the loss of some participants which made it necessary to replace them using a partial crossover with the CG participants. The dynamics of intense work in the sector compromised data collection, despite the fact that the technique was applied at the place where the professionals work. The stimulation of the points 15 times, three times a day, may not have been performed systematically by the participants, but the use of radionic crystals does not empirically require stimulation of the points to provide a better effect.

The stimulation of the points was oriented to prevent people who have already used auriculotherapy with seeds and acquired the habit of doing the stimulation from generating a bias due to the effect of the additional stimulus.

The perfect location of the point is fundamental to its effect. Thus, the use of an electronic point locator (*Acuspointer* or *Ryodoraku*) or a pulse exam associated with stimulation of the auricular point, called the Vascular Autonomic Signal (VAS), which is a mediated pulse modification by the autonomic nervous system developed by Nogier,<sup>22</sup> or the needle contact test,<sup>30</sup> are suggested for future studies to improve the accuracy of the auricular points.

## Conclusion

The comparative analysis using the BRUMS instrument showed that Chinese auriculotherapy had a beneficial effect on the mood of nursing professionals in the IG, with improvement in the total score of the scale and in the tension and mental confusion domains, thus also demonstrating applicability of the stress protocol in improving of mood. The improvement in mood is reflected in interpersonal relationships with the work team and with patients, favoring communication and humanization in care. It is a quick and easy to apply intervention which can be performed in the work environment of professionals.

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