



ORIGINALES

Auriculotherapy in the control of anxiety and stress

A auriculoterapia no controle da ansiedade e do estresse

La auriculoterapia en el control de la ansiedad y el estrés

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ABSTRACT:

Introduction: Post-modernity requires from individuals critical awareness and, consequently, changes in the educational sector, favoring the triggering of mental disorders in professors, main contributor in the creation of this awareness. Auriculotherapy is an easy-to-apply practice that can be useful in these problems.

Objective: To analyze the effect of auriculotherapy in the anxiety and stress scores of professors working in Elementary School I and II and in the Youth and Adult Education program of a municipal Elementary School in João Pessoa, capital of the state of Paraíba.

Method: An intervention study of the before-and-after type, approved by the Ethics and Research Committee of the Federal University of Paraíba under CAAE: 16803119.3.0000.5188. Five data collection instruments were applied: three semi-structured questionnaires and two scales (Hamilton Anxiety Scale and Perceived Stress Scale). By applying the exclusion criteria, data of 11 professors were analyzed, which were organized in statistical spreadsheets and analyzed through descriptive analysis, Tukey's test, ANOVA, and Wald.

Results: Auriculotherapy attained a statistically significant effect on anxiety between the first and fourth sessions and, for stress, between the first and ninth sessions, given that, for anxiety, this effect was intensified in the professors who worked in two educational institutions.

Conclusions: Auriculotherapy was successful in the reduction of the stress and anxiety scores, contributed to the improvement in the main symptoms of these disorders, and promoted self-perception.

Keywords: Complementary Therapies; Auriculotherapy; Anxiety; Occupational Stress; Teachers.

RESUMO:

Introdução: A pós-modernidade requer do indivíduo uma consciência crítica e consequentemente mudanças no setor educacional, favorecendo o desencadeamento de agravos de saúde mental nos professores, principal contribuinte na formação dessa consciência. A auriculoterapia é uma prática de fácil aplicação que pode atuar nesses agravos.

Objetivo: Analisar o efeito da auriculoterapia nos escores de ansiedade e estresse dos professores do ensino fundamental I e II e do programa Educação de jovens e adultos de uma escola municipal de Ensino Fundamental em João Pessoa, capital do estado da Paraíba.

Método: Estudo de intervenção do tipo antes e depois, aprovado pelo Comitê de ética e pesquisa da Universidade Federal da Paraíba sob CAAE: 16803119.3.0000.5188. Foram aplicados cinco instrumentos de coleta de dados, três questionários semiestruturados e duas escalas (escala de ansiedade de Hamilton e escala de estresse percebido). Ao aplicar os critérios de exclusão foram analisados os dados de 11 professores, os quais foram organizados em planilhas estatísticas e analisados através da análise descritiva, teste de Tukey, ANOVA e Wald.

Resultados: A auriculoterapia obteve efeito estatisticamente significativo na ansiedade entre a primeira e quarta sessão de auriculoterapia, e para o estresse, entre a primeira e nona sessão, sendo que para a ansiedade esse efeito foi intensificado nos professores que lecionavam em duas instituições de ensino.

Conclusões: A auriculoterapia atuou com êxito na redução dos escores de estresse e ansiedade, contribuiu na melhora dos principais sintomas desses agravos e atuou na promoção da auto percepção.

Palavras-chaves: Terapias Complementares; Auriculoterapia; Ansiedade; Estresse Ocupacional; Docentes.

RESUMEN:

Introducción: La posmodernidad requiere del individuo una conciencia crítica y, en consecuencia, cambios en el sector educacional, favoreciendo el desencadenamiento de problemas de salud mental en los docentes, principal contribuyente en la formación de esa conciencia. La auriculoterapia es una práctica fácil de aplicar que puede aliviar estos problemas.

Objetivo: Analizar el efecto de la auriculoterapia en los puntajes de ansiedad y estrés de los maestros de primaria I y II y del programa de Educación de Jóvenes y Adultos en una escuela primaria municipal de João Pessoa, capital del estado de Paraíba.

Método: Estudio de intervención del tipo antes y después, aprobado por el Comité de Ética e Investigación de la Universidad Federal de Paraíba bajo CAAE: 16803119.3.0000.5188. Se aplicaron cinco instrumentos de recolección de datos, tres cuestionarios semiestruturados y dos escalas (escala de ansiedad de Hamilton y escala de estrés percibido). Al aplicar los criterios de exclusión, se analizaron los datos de 11 docentes, los cuales fueron organizados en hojas de cálculo estadístico y analizados mediante análisis descriptivo, prueba de Tukey, ANOVA y Wald.

Resultados: La auriculoterapia tuvo un efecto estadísticamente significativo sobre la ansiedad entre la primera y cuarta sesiones de auriculoterapia, y para el estrés, entre la primera y la novena sesiones, y para la ansiedad, este efecto se intensificó en los docentes que impartían clases en dos instituciones educativas.

Conclusiones: La auriculoterapia ha actuado con éxito en la reducción de las puntuaciones de estrés y ansiedad, ha contribuido a la mejora de los principales síntomas de estos trastornos y ha actuado en la promoción de la autopercepción.

Palabras clave: Terapias Complementarias; Auriculoterapia; Ansiedad; Estrés Laboral; Docentes.

INTRODUCTION

Post-modern society has been characterized by consumption, individualism, excess of information and technologies, and sociocultural diversity. This context requires from individuals the development of a critical, reflexive, dynamic, and updated awareness that implies changes in the sector considered capable of revolutionizing how this society establishes relationships and produces: the educational sector. Therefore, different educational programs were included in public schools so as to resignify knowledge and create new ways of producing and using it⁽¹⁻⁴⁾.

In this scenario, professors stand out as main actors to promote the necessary changes since, in addition to leading students in the learning process, they articulate between the school world and the post-modern world, meet some family demands,

and also act in the relational aspect. However, despite the responsibilities assumed, the educational policies have not valued the work of educators, and the precarious working conditions of these professionals have contributed to making mental distress the most prevalent health problem in this population^(3,5-7).

Considering such evidence, as well as the fact that Brazil is the country that most uses antidepressants and anxiolytics, the need to implement other forms of mental health assistance is evidenced, such as the use of Integrative and Complementary Practices (ICPs). ICPs constitute a set of practices aimed at strengthening the principles of the Unified Health System by preventing diseases, promoting health, and treating people based on the biopsychosocial model. With the implementation of such practices, it was possible to offer other free medical rationales that were only available in private institutions. Among these practices is auriculotherapy, a Traditional Chinese Medicine (TCM) method that stimulates points on the auricular pavilion, which is quite innervated and, when stimulated, provokes reactions in the neurovegetative system, in organs, or in regions due to the meridians, re-establishing homeostatic balance^(6,8-11).

By recognizing the benefits of auriculotherapy as an ICP of simple and inexpensive application with few or no side effects, and which also acts in emotional/psychological problems, it is argued that the systematic offer of sessions of this ICP can promote mental health in the benefited population, in addition to decreasing anxiety and stress levels⁽¹¹⁻¹³⁾.

Considering the context presented, this research was guided by the following questions: What are the anxiety and stress scores of professors working in Elementary School I and II and in the Youth and Adult Education (*Educação de Jovens e Adultos*, EJA) program? What is the impact of auriculotherapy on the anxiety and stress scores of these professors? What is the effect of auriculotherapy in the main symptoms of anxiety and stress?

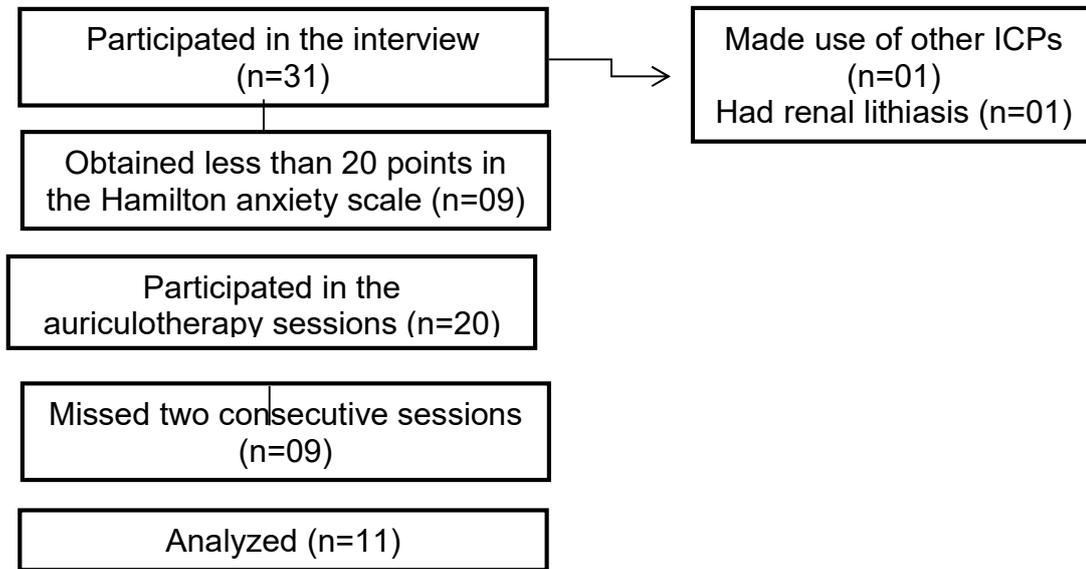
Consequently, the objective of the study was the following: To analyze the effect of auriculotherapy in the anxiety and stress scores and symptoms of professors working in Elementary School I and II and in the EJA of a municipal Elementary School of João Pessoa, capital of the state of Paraíba.

MATERIAL AND METHOD

This is an intervention study of the before-and-after type, carried out with professors working in Elementary School I and II and in the Youth and Adult Education program of a municipal Elementary School in João Pessoa, capital of the state of Paraíba.

Professors who were working for at least 6 months and who were not on leave during data collection participated in the study and voluntarily attended nine auriculotherapy sessions. The individuals excluded from the research were those who made use of other complementary therapies, those who had renal lithiasis (the ear point related to the kidney can stimulate the elimination of kidney stones), and those who scored, in the first interview, less than 20 points in the Hamilton anxiety scale⁽¹⁴⁾. Throughout the sessions, 09 participants were lost for missing two or more consecutive sessions, with 11 teachers being considered for data analysis.

Figure 1: Flow diagram of the selection of the subjects. João Pessoa, Paraíba. 2020.



Source: Research data, 2020.

Five instruments were applied for data collection, with three being semi-structured questionnaires used to: characterize the participants, identify the characteristic symptoms of anxiety and stress and the changes that occurred in the week preceding to the sessions, both those related to auriculotherapy (pain in ear points and their removal), as well as those that could exert an influence on the scores obtained through the scales; and to verify the professors' self-perception regarding the effect of auriculotherapy in the symptoms reported, where, for each symptom studied, the following auriculotherapy results were attributed: “no effect”, if no effect was observed, “it improved”, “it worsened”, and “does not apply” in case the symptom reported was not perceived. The other instruments were the Hamilton Anxiety Scale and the Perceived Stress Scale (PSS-10).

The Hamilton anxiety scale is an instrument to assess neurotic anxiety, and is considered a reliable and easy-to-apply scale, adapted for the Brazilian reality, quite used in therapeutic research studies for anxiety and depression. It is composed of 14 items, with items from 1 to 6 and 14 related to psychic anxiety and item from 7 to 13, related to somatic anxiety. For each item, a Likert value that can range from zero to four depending on the intensity with which the symptoms are present in the participant's daily life is assigned; the sum of these values results in a total score from zero to 56^(13,14).

The Perceived Stress Scale (PSS) was developed in 1983 by Cohen, Kamarck and Mermelstein to identify the level in which daily situations are assessed as stressful by the individuals. PSS-10 is an adapted version of PSS-14, characterized as the most recommended because it can be used in combination with other instruments and for presenting satisfactory indicators. Its answers are in the Likert format, which ranges

from zero (never) to four (always) points and is divided into items considered negative and positive⁽¹⁵⁾.

With the participants' authorization, the first data collection moment was initiated: filling of the semi-structured questionnaire of the subjects' characterization and of the semi-structured questionnaire used prior to each application of auriculotherapy, and the application of the Hamilton and PSS-10 scales, respectively. During the application of both scales, the participants' behavior (restless legs, verbalization of thoughts, facial expressions, and others) was observed and reported in the researcher's Field diary.

Once the stage in which the data collection instruments were applied was over, mustard seeds were applied on the ear points previously determined by the researcher to treat the main symptoms of anxiety and stress listed in the literature (*Shenmen*, sympathetic, kidney, heart, liver, gallbladder, muscle relaxation, and anxiety). The application technique consisted in cleaning the auricular pavilion by using cotton soaked with 70% ethyl alcohol and applying the seeds with *micropore* tape on the aforementioned ear points.

At the end of the session, the participants were instructed to stimulate the ear points from three to four times a day, remove them if they were causing unbearable pain, and practicing self-perception during the week, reporting in the participant's field diary their complaints and changes in behavior, sleep, and body.

In the subsequent sessions (2nd, 3rd, 4th, 5th, 6th, 7th, 8th, and 9th), the semi-structured questionnaire used before each session and the researcher's field diary were applied as data collection instrument, respectively; in the 4th and 9th sessions, the Hamilton anxiety scale and PSS-10 were also applied, adding in the 9th session the questionnaire aimed at assessing the professors' self-perception about the effect of auriculotherapy on the anxiety and stress symptoms.

The data characterizing the subjects together with the anxiety and stress scores obtained through the scales were arranged in absolute and percentage frequency, and analyzed through descriptive and inferential statistics.

In order to identify the session in which the significant effect of auriculotherapy started, the model of non-parametric repeated measures was used. For this, the multivariate Shapiro-Wilk's test was initially used to confirm multivariate normality. Subsequently, Mauchly's test was applied (used to assess the sphericity hypothesis) and, finally, Tukey's test to perform multiple comparisons between the sessions. These last results were obtained with the aid of the *livre Past* 4.0 software.

The model of repeated measures was also used to assess the effect of auriculotherapy on the anxiety and stress scores considering the school factor; the answers obtained over time corresponding to the beginning (session zero), after four weeks (session four), and in the end (session nine) were processed by applying *library nparLD* from the R software; in this way, two statistics were calculated, Wald's and ANOVA significance level ≤ 0.05 .

For obtaining Graph 3, the semi-structured questionnaire used before each auriculotherapy application to identify the characteristic symptomatology of stress and anxiety was analyzed, as well as the instrument that assessed the professors' self-

perception about the effect of auriculotherapy on these symptoms. The answers were arranged in absolute frequency and represented in Graph 3 in a decreasing order of the symptoms that presented higher frequency of improvement with auriculotherapy,

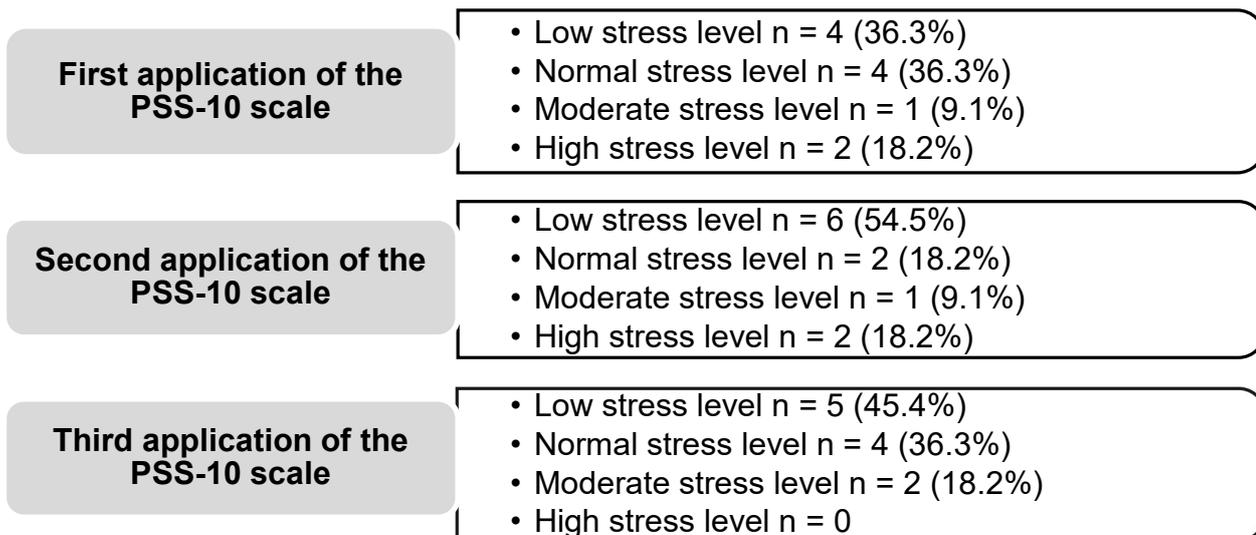
RESULTS

When the Perceived Stress Scale was applied for the first time, 4 professors (36.3%) were classified as with low stress level, 4 (36.3%) as with normal level, 1 (9.1%) as with moderate level, and 2 (18.2%) as with high level.

In the fourth session, when the scale was applied for the second time, an increase in the number of participants classified as with low stress level was observed, as 2 professors who were in the normal level were added, thus accounting for 6 professors (54.5%) with low level and 2 (18.2%) with normal level; the moderate and high levels remained with 9.1% and 18.2%, respectively. However, a professor who was classified as with high stress level went down to moderate level, and the one classified as moderate level went up to high level.

In the last application, ninth session, 5 participants (45.4%) were accounted for with low stress level, as one participant went to normal level, which was represented by 4 professors (36.3%), with one also coming from the high level; the other participants, 2 professors (18.2%), were classified as with moderate stress level, where one of them came from high level. Figure 2 shows the number of professors classified in each stress level during the application of the PSS-10 scale.

Figure 2: Number of professors classified in each stress level during the applications of the PSS-10 scale. João Pessoa, Paraíba. 2020



Source: Research data, 2020.

When applying the Hamilton anxiety scale for the first time, it was possible to classify 2 professors (18.2%) as with moderate anxiety, and 9 (81.8%) as with intense or severe anxiety. In the second application of the scale, 3 professors (27.3%) who were classified as with severe or intense anxiety obtained scores compatible with mild anxiety; 5 (45.4%) were classified as with moderate anxiety, and 3 (27.3%) remained as with severe or intense anxiety.

The number of participants classified as with mild anxiety increased in the third application of the Hamilton scale, totaling 6 professors (54.5%), with three of them coming from the moderate anxiety level. Therefore, moderate anxiety started to be represented by 2 professors (18.2%) coming from the severe or intense anxiety levels; this, in turn, was represented by 3 participants (27.3%), with 2 (18.2%) from the moderate level. Figure 3 allows for a better understanding of these reclassifications of the anxiety scores.

Figure 3: Number of professors classified in each anxiety level during the applications of the Hamilton scale. João Pessoa, Paraíba. 2020.

First application of the Hamilton scale	<ul style="list-style-type: none"> • Mild anxiety n= 0 • Moderate anxiety n = 2 (18,2%) • Severe or intense anxiety n = 9 (81,8%)
Second application of the Hamilton scale	<ul style="list-style-type: none"> • Mild anxiety n = 3 (27,3%) • Moderate anxiety n = 5 (45,4%) • Severe or intense anxiety n = 3 (27,3%)
Third application of the Hamilton scale	<ul style="list-style-type: none"> • Mild anxiety n = 6 (54,5%) • Moderate anxiety n = 2 (18,2%) • Severe or intense anxiety n = 3 (27,3%)

Source: Research data, 2020

As scores below 20 were used as exclusion criterion, it is not possible to show the mild anxiety level in the first application of the Hamilton scale.

By comparing Figures 2 and 3, it is possible to observe that, of the 8 professors (72.7%) classified as with low and normal stress levels, in the first application of PSS-10, 6 (75%) presented severe or intense anxiety levels in the first application of the Hamilton anxiety scale; in addition to that, there is a quick effect of auriculotherapy on the anxiety levels when compared to stress, which can be confirmed by duplicating the number of professors who moved from the moderate and severe anxiety levels into mild anxiety. This phenomenon is shown in Table 2, which compares the mean levels of anxiety and stress between the applications of the scales (first, fourth and ninth sessions).

Table 2: Comparison of the mean levels of anxiety and stress between the applications of the scales. João Pessoa, Paraíba, 2020.

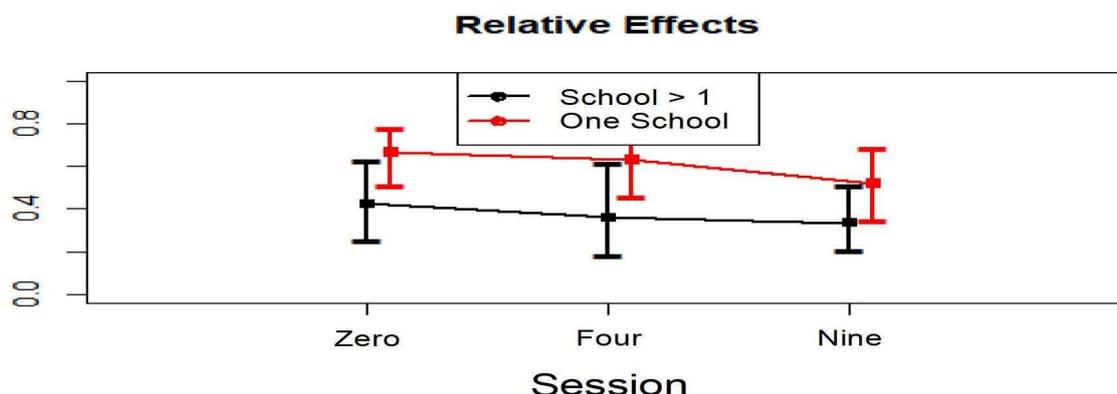
Comparison between the sessions	Tukey's Test (p-value)	
	Anxiety	Stress
0 and 4	0.004*	0.456
0 and 9	0.000*	0.003*
4 and 9	0.484	0.317

Source: Research data, 2020.

*Difference at the 5% significance level

Another difference is observed when the effect of auriculotherapy on anxiety and stress is analyzed considering the number of employment contracts; such finding is represented in Graphs 1 and 2.

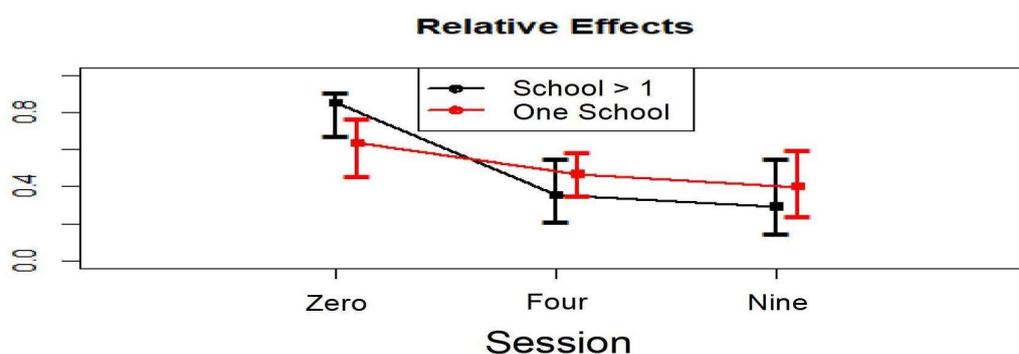
Graph 1: Effect of auriculotherapy on the stress levels assessed in the first, fourth and ninth sessions, considering the number of employment contracts. João Pessoa, Paraíba, 2020.



Source: Research data, 2020.

It is evidenced that the p -value = 0.026, valid for the two statistics (Wald and ANOVA), did not present differences for those working in one school, 5 participants (45.4%), or in two schools, 6 participants (54.5%). The same occurred with the results of Graph 2: by using the same analysis programs, this time for anxiety and the school factor, a significant result (p -value < 0.05) was obtained, in which anxiety changes over time in a differentiated manner for individuals who work in only one school and for those working in more than one school, with a higher effect for the latter.

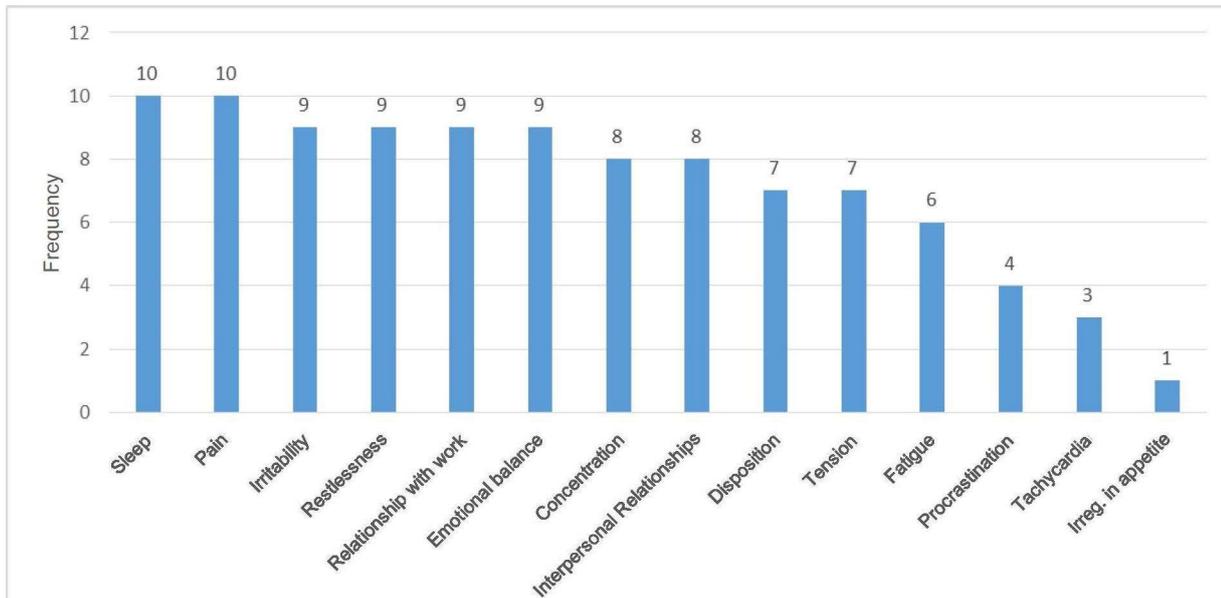
Graph 2: Effect of auriculotherapy on the anxiety levels assessed in the first, fourth and ninth sessions, considering the number of employment contracts. João Pessoa, Paraíba, 2020.



Source: Research data, 2020

The results referring to the professors' self-perception about the effect of auriculotherapy on the symptoms that characterize anxiety and stress were represented in Graph 3.

Graph 3: Decreasing order of the stress and anxiety symptoms that presented higher frequency of improvement when using auriculotherapy. João Pessoa, Paraíba, 2020.



Source: Research data, 2020.

DISCUSSION

Regarding the predominance of the low stress level in all applications of PSS-10, it is correlated with the social support obtained by the professor in the family and work environments^(16,17); concerning the work environment, the participants of this research mentioned the students as the subjects responsible for satisfaction, mainly when they recognize the social value of the profession, show interest in learning, and trust them to the point of exposing their anguishes.

Another situation related to the stress levels was workload, which can be used to justify both the predominance of the low stress level in the first application of PSS-10, as most of the participants classified worked only one shift, and also the permanence of some professors in considerable scores or their reclassification in higher scores (moderate and severe). The excessive workload justified by low remunerations and by the exercise of a profession that currently presents diversification in its work functions, exceeding the teaching-learning process and the work environment, results in consequences in the individual's physical, mental, and social aspects^(18,19).

However, workload is not a determining factor, but a contributor to stress, when work organization is also considered, which triggers or enhances mental health problems due to roles not quite clarified, power relations, and responsibilities beyond the activities related to training^(6,20,21).

The correlation manifested among the problems herein researched was questioned when some participants presented scores compatible with low stress level and severe

or intense anxiety at the same moment of application of the scales. Considering that individuals classified as with low stress level can present symptoms related to all phases of the four-phase stress model⁽¹⁶⁾ and that the triggering of trait-anxiety is associated with the stress of daily routine⁽²²⁾, it is believed that the frequent exposure of the participants to stressors, even with low intensity, triggered a process of permanent response in their organism.

In fact, not all the participants that presented severe anxiety level in the first application of the Hamilton scale complained about some atypical stressful situation (in addition to daily life) at that moment, but they did complain about some symptoms common to anxiety and stress (changes in the sleep pattern, muscle pain, irritability, and fatigue), pointing out that cortisol, a hormone produced and released by the cortex of the adrenal gland to stimulate responses to the stressor in order to neutralize it, was kept in the organism provoking exhaustion and saturation, contributing to the presence of anxiety, even in the absence of a stressful situation; classifying it as trait-anxiety, a disorder characterized by little stability, perception of a higher number of threatening events, and intense responses to situations that are truly threatening^(16,23-25).

In view of the impossibility of eliminating the triggering factors of stress and anxiety, it is necessary to reduce the amount of cortisol in the bloodstream. Accordingly, it is possible to include auriculotherapy in the set of activities capable of acting in the control of stress and anxiety, presenting a significant effect on anxiety between the first and fourth auriculotherapy sessions and, for stress, between the first and ninth sessions; this finding is related to the fact that anxiety is inherent to the participants' personality. In this way, the significant reduction in the anxiety levels results in a less intense perception of the stressful factors, making its effect also significant for stress^(11,26,27).

The correlation between auriculotherapy and work overload/number of employment contracts (main triggering factor of anxiety and stress), represented symmetrically for stress and asymmetrically for anxiety, is justified by the frequent exposure to work stress factors and by the fact that exhaustion is higher when the person spends a lot of time in the same work environment⁽²⁸⁾. In this way, it is understood that exposure to stressful factors does not depend on the number of institutions, but on the number of shifts; however, when considering anxiety as a response to these factors, we understand that it depends on the number of schools where they teach. Therefore, when the professor spends a short time in the same work environment, the response to stressors will be lower and the effect of auriculotherapy, higher^(6,18).

In the same way that individuals experience anxiety and stress in a singular manner, the effect of auriculotherapy on their symptoms is also subjective. Sleep got regulated in some participants but it was intensified in others, becoming a complaint; the same happened with fatigue and other symptoms. Despite of that, this practice is also capable of acting in the collective scope through emotional balance, irritability reduction, and a better relationship with work^(29,30).

It is important to note that few participants correlated these symptoms with anxiety or stress, which was already expected as they are generally considered as normal in the daily life of the teaching profession. It is noted that the absence of this self-perception of the stress and anxiety triggers, as well as their symptomatology, contributes to the emergence or intensification of physical and health problems^(18,29,30).

By looking beyond what is exposed, another benefit provided by the application of this ICP is identified: the stimulus for professors' self-perception, which was encouraged in the first session when they were instructed to be aware of the probable physical and emotional changes or discomfort in the ear points that were stimulated. That enabled them to pay more attention to the responses of the organism to the stressors, identify symptoms/painful ear points, and correlate with some situation experienced during that week, as well as realize the importance of being an active subject in self-care.

In order to contribute to the development of future research studies, it becomes valid to mention the limitations of this study, such as the conduction of some sessions with other school professionals present, as the room could not be used exclusively by the researcher; the need of having someone from the school available to call the professor and stay in the classroom during the auriculotherapy session; the participants' outbursts, which did not meet the study approach and extended the sessions; the sample size; and the use of a closed protocol and of mustard seeds.

It is believed that, if the professionals were valued and other activities for the promotion of mental health were available, such as the application of auriculotherapy stimulating ear points according to the participants' complaints and using semipermeable needles, which do not require the stimulation of the selected ear points from two to three times a day by the participant, the data collection phase would have been shorter, and the effect of auriculotherapy, more significant.

CONCLUSIONS

The analysis of the effect of auriculotherapy on the anxiety and stress symptoms and scores of the professors working in Elementary School I and II and in the EJA showed that auriculotherapy was successful in the reduction of the stress and anxiety scores, presenting a statistically significant effect for anxiety between the first and fourth session, being higher in the professors who worked in two educational institutions and, for stress, between the first and ninth session, not presenting any significant difference between those who worked in one or two educational institutions. In addition to that, it contributed to the improvement of the main symptoms of these mental health problems, mainly regarding sleep, pain, irritability, relationship with work and emotional balance, also promoting self-perception; however, just as benzodiazepines, its effect is also temporary, unlike the stressors present in the work environment on a daily basis.

Therefore, the need to implement solutions that improve the working conditions and reduce overload is evidenced, such as educational public policies to guarantee decent wages, as well as individual and collective strategies to reduce stress and anxiety and to promote mental health with a repercussion on quality of life. These solutions must be implemented by the managers of the three governmental spheres, of the educational institutions, and of the scientific community.

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