# Reflexotherapy and auriculotherapy for acute lumbalgia in university teachers and students: A double-blind clinical trial

**RESUMO |** Objetivo: comparar os efeitos da auriculoterapia e reflexoterapia podal para lombalgia aguda inespecífica em docentes e discentes universitários da área da saúde. Método: ensaio clínico, randomizado, controlado, duplo-cego, com 189 participantes distribuídos em três grupos: auriculoterapia experimental, reflexoterapia experimental e combinadas. Fora realizados 3 intervenções. Para a coleta foram utilizados: Questionário Sociodemográfico; Escala Visual e Analógica de intensidade na avaliação da dor; e Questionário para Lombalgia. Os dados foram analisados no programa IBM SPSS Statistics versão 18.0 Foram aplicados: teste de normalidade Kolmogorov-Smirnov; testes Qui-quadrado ou Exato de Fisher para comparação entre os grupos, e Análise de variância com post hoc ou Kruskal-Wallis, conforme apropriado. Resultados: evidenciou-se redução significativa da dor nos três protocolos (p=<0,001) para o Questionário de lombalgia, mas na comparaçãoda escala da dor, houve menor eficácia no grupo combinado (p=0,006). Conclusão: Ambas as terapias são eficazes e indicadas para controle da lombalgia aguda.
**Descritores:** Auriculoterapia; Dor lombar; Reflexoterapia; Serviços de saúde para estudantes.

**ABSTRACT |** Objective: to compare the effects of auriculotherapy and foot reflex therapy for nonspecific acute low back pain in university professors and students in the health area. Method: clinical trial, randomized, controlled, double-blind, with 189 participants divided into three groups: experimental auriculotherapy, experimental reflex therapy and combined therapy. Three interventions were performed. For data collection, the following were used: Sociodemographic Questionnaire; Visual and Analog Scale of intensity in pain assessment; and Low Back Pain Questionnaire. Data were analyzed using the IBM SPSS Statistics program, version 18.0. The following were applied: Kolmogorov-Smirnov normality test; Chi-square or Fisher's Exact tests for comparison between groups, and Analysis of variance with post hoc or Kruskal-Wallis, as appropriate. Results: there was a significant reduction in pain in the three protocols (p=<0.001) for the Low Back Pain Questionnaire, but when comparing the pain scale, there was less efficacy in the combined group (p=0.006). Conclusion: Both therapies are effective and indicated for the control of acute low back pain.
**Keywords:** Auriculotherapy; Backache; Reflexotherapy; Student health services.

**RESUMEN |** Objetivo: comparar los efectos de la auriculoterapia y la terapia refleja podal en el dolor lumbar agudo inespecífico en profesores y estudiantes universitarios del área de la salud. Método: ensayo clínico, aleatorizado, controlado, doble ciego, con 189 participantes divididos en tres grupos: auriculoterapia experimental, terapia refleja experimental y terapia combinada. Se realizaron tres intervenciones. Para la recolección de datos, se utilizaron: Cuestionario Sociodemográfico; Escala Visual y Analógica de intensidad en la valoración del dolor; y Cuestionario de dolor lumbar. Los datos fueron analizados mediante el programa IBM SPSS Statistics, versión 18.0, se aplicaron: prueba de normalidad de Kolmogorov-Smirnov; Pruebas Chi-cuadrado o Exacto de Fisher para comparación entre grupos, y Análisis de varianza con post hoc o Kruskal-Wallis, según corresponda. Resultados: hubo reducción significativa del dolor en los tres protocolos (p=<0,001) para el Low Back Pain Questionnaire, pero al comparar la escala de dolor, hubo menor eficacia en el grupo combinado (p=0,006). Conclusión: Ambas terapias son efectivas e indicadas para el control del dolor lumbar agudo.
**Palabras claves:** Auriculoterapia; Dolor de espalda; reflexoterapia; Servicios de salud para estudiantes.

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## INTRODUCTION

The routine of the university environment is characterized by a substantial demand for work that requires

constant updating, including: studies; face-to-face and distance activities; curricular and extracurricular internships; elaboration and presentation of projects; research development, among others. (1-3) For professors, the demands of the university context are enhanced due to the reality of their competence, which may compromise their state of health, productivity, creativity and, consequently, the quality of their work. (2-4) The constant need to respond to the demands of the academic environment, both for professors and students, can generate relevant clinical conditions, such as: tiredness, stress, changes in attention and sleep quality, and physical and motor implications, such as low back pain. (5-6)

Low back pain is defined as pain or discomfort located between the lower border of the rib cage and the gluteal fold, which can extend to the lower limbs. (7) It is classified as: acute (appears suddenly and can last up to 4 weeks), subacute (occurs from 4 to 12 weeks) or chronic (greater than 12 weeks). The intensity of low back pain can vary from mild to severe, and be differentiated into 3 categories: low back pain associated with a specific disease in the spine; low back pain with the presence of a neuropathic component; and nonspecific or idiopathic low back pain, the latter being the object of this study, classified as acute. (7-9)

Acute nonspecific low back pain is more a symptom than a pathology and corresponds to 85% of low back pain without an evident and/or specific cause. (10) It is characterized by sudden pain associated or not with: a mechanical act, a degenerative process of the lumbar vertebrae; aggravation of lordosis; and/or decreased abdominal muscle tone, and its treatment is usually based on its classification, intensity and category.(1,7-8)

Interventions and protocols performed to control low back pain are usually pharmacological, which can generate undesirable side effects. However, there are non-pharmacological measures that can contribute to pain management and well-being preservation, such as: physiotherapy, postural re-education, Chinese medicine practices, massage, among others. (11)

In this context, non-pharmacological practices, such as auriculotherapy and reflex therapy, can contribute to the treatment of low back pain, as they promote therapeutic effects through the stimulation of free nerve endings located in the extremities of the body, such as feet, hands and ears. Such modalities are included in the list of integrative and complementary practices (PICS) offered in the Unified Health System - SUS (12) and are encouraged by management bodies to be implemented due to their easy access and scientifically proven effectiveness. (11,13-15)

In this perspective, the present research aims to compare the effects of auriculotherapy and foot reflex therapy for nonspecific acute low back pain among three sample groups consisting of university students and professors in the health area. Thus, we defend the hypothesis that interventions with foot reflex therapy and auriculotherapy promote an immediate and mediated effect in the reduction of nonspecific low back pain in professors and university students in the health area.

## METHOD

This is a controlled, randomized, double-blind, quantitative clinical trial. The research was carried out at a University in the south of the country and has the Brazilian Registry of Clinical Trials (ReBEC - Registro Brasileiro de Ensaios Clínicos), code: RBR-4v7bqx. Teachers and students from the health area participated in the study.

The dissemination was carried out with the support of the coordination of the courses through posters posted on the university walls, social media and email. Sampling was probabilistic and the sample size was calculated using the Open Source Epidemiologic Statistics for Public Health (OpenEpi) 3.03a program at Emory University, Rollins School of Public Health, Atlanta, USA. The calculation was based on two studies, since no publications were found that used both interventions proposed in this work (auriculotherapy and foot reflex therapy).

The first study, which described the effects of foot reflex therapy in relieving acute low back pain, observed a mean pain intensity of 4.26±1.44 in the control group and 0.24±0.43 in the experimental group, after intervention . (13) Considering a 95% confidence interval, 80% power, 2 participants would be needed in each group. Plus 20% of losses and refusals, the total sample would be seven participants.

In the second study, which evaluated the effectiveness of magnetotherapy in relieving low back pain, mean pain intensity scores of 2.27±0.58 were observed in the control group and 1.87±0.68 in the experimental group at the end of the investigation. (15) Considering a 95% confidence interval, 80% power, 40 participants would be needed in each group. Plus 20% of losses and refusals, the total sample would be 144 participants. Given the need to analyze the two interventions, it was decided to calculate the unified sample, with 151 participants divided into three groups.

The following eligibility criteria were adopted: being a professor and/or student in the health area of the researched university; be available to participate in all established sessions; to present acute pain in the lumbar region; not present injuries, scars, inflammatory or infectious processes that compromise the sensitivity and manipulation of the ear and feet points.

For exclusion, it was determined as a criterion: being undergoing specific treatment to relieve low back pain, with another complementary practice; be participating in some other research for pain relief; being pregnant; having performed surgeries on the auricular pavilion that have altered the anatomy of the nerve endings and the auricular structure; presenting vascular disorders in the lower limbs such as varicose ulcers and/or thrombosis; severe diabetes with loss of peripheral sensation; having undergone surgery on the feet and showing signs of scarring and

sensitivity; use drug therapy to control or relieve pain (analgesics and opioids).

The number of sessions, time and intervention protocol of this study were replicated from a clinical trial that showed the effects of foot reflex therapy to relieve low back pain in the nursing team of a university hospital in southern Brazil. (13) The selection of points in the auriculotherapy protocol derived from a clinical study focused on back pain in nursing professionals, which compared the analgesic effects of Zen Shiatsu with auricular acupuncture. (16)

Thus, for the auriculotherapy protocol, the application of mustard seeds (as a stimulus device) in the shenmen points, lumbar vertebrae (lumbar region) and the kidney reflex point was determined: for the experimental group. In the control group, only the micropore was applied over the same points. Before the application, the ear pavilion was cleaned with cotton and 70% ethyl alcohol. The participants were instructed to keep the stitches, without stimulating them, for 4 days and to notify the collaborators if any of them fell. The choice of seeds was based on the safety of the integrity of the participants' skin, in order to avoid the risk of infection, dermatitis and allergic reactions to other materials, such as metal. (17)

For the application of the protocols, five collaborators qualified in auricular and foot reflex therapy, with at least 18 months of experience, were recruited. All were trained to apply the intervention protocol, before the start of collection. To equalize grip and touch pressure in the protocols, a BL® hydraulic dynamometer with a capacity of 200 pounds was used. The grip applied by the collaborators for the experimental protocols was established between 18 and 20 pounds, and for the control protocols 3 to 5 pounds.

For data collection, the following were used: Socio-demographic characterization questionnaire; Visual and Analog Pain Scale (VAS) and the Low Back Pain Questionnaire (LBPQ). The sociodemographic questionnaire addressed questions such as: university activity carried out by the participant, sex, course, title, marital status, children, whether they performed household chores, if they had an employment relationship, performed physical activity regularly, and if they had already been away from work because of low back pain.

The VAS instrument, in turn, is a numerical scale (similar to a ruler) that associates illustrations of facial expressions to a numbering, where pain can be classified as: mild (represented by numbers from 0 to 2), moderate (3 to 7) and intense (8 to 10). The LBPQ, on the other hand, is a structured questionnaire with 27 questions that evaluates, through a scale from 0 to 4, the level of commitment that pain causes to the individual in the exercise of their daily activities. The scale determines: 0 - no pain, 1 - little pain, 2 - fair pain, 3 - a lot of pain, but bearable, 4 - unbearable pain.

Initially, the study had the presence of 213 participants randomly allocated into 3 groups: a) Experimental Auriculotherapy (AE) and Control Reflexotherapy (CR) Group; b) Experimental Reflexotherapy (ER) and Experimental Auriculotherapy (EA) Group; and c) Experimental Reflexotherapy (ER) and Control Auriculotherapy (CA) Group. Randomization was carried out by raffling closed envelopes containing numbers from 1 to 240. All the work was organized in three moments with an interval of seven days between them. The collection took place between February and August 2019.

At the beginning of the first meeting, participants were asked to complete the characterization questionnaire, the QL and to identify their level of pain on the VAS. Then, the participant was submitted to the intervention protocol. At the end, he was asked to identify his pain level on the VAS again. The duration of time to answer the questionnaires and receive the practice was approximately 40 minutes.

In the second session, pain assessment was performed on the VAS, before and after the application of the protocol, which followed the same steps as in the first session. The allotted time was approximately 30 minutes. Finally, the third meeting was intended only for completing the LBPQ and VAS, which lasted approximately 5 minutes. The total intervention period for each participant was 21 days.

For the analysis, a database was prepared in Excel® spreadsheets, later exported to the IBM SPSS® Statistics 18.0® software (SPSS Inc., Chicago, USA) for statistical analysis. Quantitative (ordinal) variables were represented by mean, standard deviation or median, minimum and maximum values. Qualitative (nominal) variables were presented by absolute (n) and relative (%) frequency. To test the normality of the sample, the Kolmogorov-Smirnov test was used.

To analyze the association of nominal variables with frequencies of pain intensity, the chi-square or Fisher's exact test was used. The analysis between groups occurred according to data distribution. In cases of parametric distribution, Analysis of Variance (ANOVA) with Bonferroni's pos hoc was used. In non-parametric cases, the Kruskal-Wallis test for independent samples was used. In this study, a significance level of 5% was adopted for a confidence interval (CI) of 95%.

The study met the ethical and legal precepts established by Resolution 466/12 of the National Health Council, obtaining approval from the Human Research Ethics Committees of the Federal University of Santa Catarina (CEPSH/UFSC) under opinion 3.037.260 (11/25/2018) and of the University of Southern Santa Catarina (CEP-UNISUL) under opinion: 3,057,814 (12/05/2018). Only after the signature of the Term of Free and Informed Consent (TFIC) by the participants that the collection was initiated.

**RESULTS**

The study started with 213 professors and university students, but 27 were excluded: 9 due to withdrawal and 18 due to absence during the follow-up of the research, totaling 189 effective participants

randomly distributed between the groups, as described in the flowchart (Figure 1).

Participants had a mean age of 32.97(± 9.74) years, with no significant difference between groups (p=0.109). Regarding the time of activity development in an academic environment, the average between the groups was 70.10 (±64.21) months, corresponding to a homogeneous distribution between the three groups (p=0.225). Among the participants, 88.9% were studying undergraduate courses and only 11.1% were taking graduate courses. Of the total, 55.6% worked and studied. Table 1 shows the sociodemographic characterization of the three groups.

It should be noted that the categorization of the variable "course" occurred in five categories. The nutrition/others category included nutrition courses (n=26), medicine (n=09), dentistry (n=09) and cosmetology in aesthetics and health (n=02), totaling the inclusion of eight different courses in the health area in this study.

Table 2 shows the results of median pain intensity and control variables throughout the research, bringing information about the immediate and mediate effects between the researched groups.

When comparing the final score between the 1st and 21st day of the survey, between the three groups, in the Low Back Pain Questionnaire, the protocols showed a statistically significant difference (p<0.001) (Graph 1).

## DISCUSSION

Interventions with foot reflex therapy and auriculotherapy showed significant results for the relief of nonspecific low back pain by VAS (p=0.006) and QL (p<0.001), when comparing groups. The results show that the three intervention protocols triggered analgesia, both for stimuli provoked in the free nerve endings of the feet (reflexotherapy) (8,13,18), how much of the free nerve endings of specific points of the external ear pinna



Figure 1 - Research flow diagram – Florianópolis, SC, Brazil, 2020.
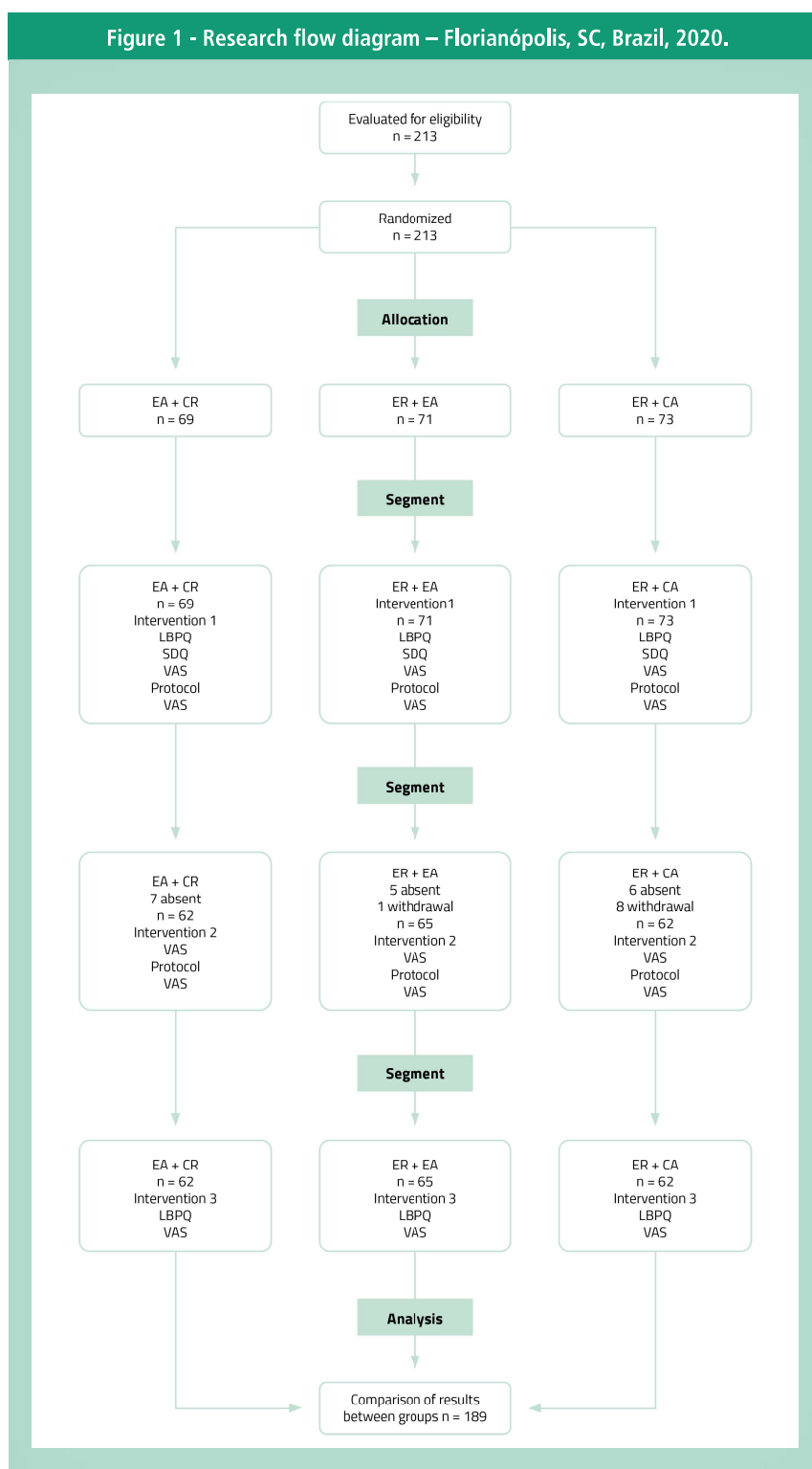
LBPQ = Low back pain questionaire
SDQ = Sociodemographic questionaire
VAS = Visual and Analog Pain Scale
Source: Prepared by the authors, 2020.

**Table 1 – Descriptive characterization of sociodemographic variables in the three sample groups – Florianópolis, SC, Brazil, 2020.**

| Variables | Total (n= 189) | EA+CR (n= 62) | ER+EA (n= 65) | ER+CA (n= 62) | •p |
|---|---|---|---|---|---|
| **Activity** | | | | | |
| Student - n (%) | 144 (76,2) | 52 (83,9) | 46 (70,8) | 46 (74,2) | 0,201 |
| Teacher - n (%) | 45 (23,8) | 10 (16,1) | 19 (29,2) | 16 (25,8) | |
| **Gender** | | | | | |
| Male - n (%) | 43 (22,8) | 15 (24,2) | 15 (23,1) | 13 (21,0) | 0,910 |
| Female - n (%) | 146 (77,2) | 47 (75,8) | 50 (76,9) | 49 (79,0) | |
| **Course** | | | | | |
| Physiotherapy - n (%) | 44 (23,3) | 14 (22,6) | 15 (23,1) | 15 (24,2) | |
| Nursing- n (%) | 41 (21,7) | 17 (27,4) | 15 (23,1) | 9 (14,5) | |
| Naturology- n (%) | 31 (16,4) | 9 (14,5) | 9 (13,8) | 13 (21,0) | 0,714 |
| Physical Education- n (%) | 27 (14,3) | 7 (11,3) | 12 (18,5) | 8 (12,9) | |
| Nutrition/others- n (%) | 46 (24,3) | 15 (24,2) | 14 (21,5) | 17 (27,4) | |
| **Titration** | | | | | |
| Undergraduates and graduates - n (%) | 168 (88,9) | 62 (100) | 46 (70,8) | 50 (96,8) | < 0,001 |
| Post-graduation - n (%) | 21 (11,1) | 0 (0,0) | 19 (29,2) | 2 (3,2) | |
| **Marital status** | | | | | |
| Single - n (%) | 123 (65,1) | 44 (71,1) | 36 (55,4) | 43 (69,4) | 0,127 |
| Married - n (%) | 66 (34,9) | 18 (29,0) | 29 (44,6) | 19 (30,6) | |
| **Children** | | | | | |
| Yes - n (%) | 75 (39,68) | 22 (37,3) | 32 (54,2) | 21 (35,6) | 0,389 |
| No - n (%) | 114 (60.3) | 37 (62,7) | 27 (45,8) | 41 (64,4) | |
| **Houseworks** | | | | | |
| Yes - n (%) | 101 (53,4) | 30 (48,4) | 40 (61,5) | 31 (50,0) | 0,267 |
| No - n (%) | 88 (46,6) | 32 (51,6) | 25 (38,5) | 31 (50,0) | |
| **Employment relationships** | | | | | |
| None - n (%) | 79 (41,8) | 12 (19,4) | 44 (67,7) | 23 (37,1) | |
| 1- n (%) | 105 (55,6) | 47 (75,8) | 21 (32,3) | 37 (59,7) | < 0,001 |
| More than one - n (%) | 5 (2,6) | 3 (4,8) | 0 (0,0) | 2 (3,2) | |
| **Regular physical exercise** | | | | | |
| Yes - n (%) | 135 (71,4) | 43 (69,4) | 48 (73,8) | 44 (71,0) | 0,851 |
| No - n (%) | 54 (28,6) | 19 (30,6) | 17 (26,2) | 18 (29,0) | |
| **Time off from work because of pain** | | | | | |
| Yes - n (%) | 15 (7,9) | 8 (12,9) | 4 (6,2) | 3 (4,8) | 0,050 |
| No - n (%) | 159 (84,1) | 54 (87,1) | 61 (93,8) | 59 (95,2) | |

EA+CR = experimental auriculotherapy + Control reflex therapy.
ER+EA = Experimental Reflexotherapy + Experimental Auriculotherapy.
ER+CA = Experimental Reflexotherapy + Control Auriculotherapy.
Source: Prepared by the authors, 2020.

(auriculotherapy). (19)

Even considering that acute low back pain tends to improve without interventions over days (20), experiencing pain generates discomfort; limitation of physical mobility; alteration of the emotional

| Table 2: Medians of pain intensity collected by the VAS instrument in the three groups, 2020. Samples. | | | | | |
|---|---|---|---|---|---|
| Variables | Total (n= 189) | EA+CR (n= 62) | ER+EA (n= 65) | ER+CA (n= 62) | •p |
| First analysis | 5 (3-8) | 5 (3-8) | 6 (3-7) | 5 (3-8) | 0,013 |
| Immediate analysis after the first application | 2 (0-4) | 2 (0-4) | 2 (0-4) | 1 (0-3) | 0,005 |
| Analysis 7 days after application 1 | 3 (0-6) | 3 (1-6) | 3 (0-5) | 3 (0-6) | 0,414 |
| Immediate analysis after application 2 | 0 (0-3) | 0 (0-3) | 0 (0-2) | 0 (0-2) | 0,062 |
| Final analysis- 7 days after application 2 | 0 (0-3) | 1 (0-3) | 0 (0-1) | 0 (0-3) | 0,006 |

EA+CR = experimental auriculotherapy + Control reflex therapy.
ER+EA = Experimental Reflexotherapy + Experimental Auriculotherapy.
ER+CA = Experimental Reflexotherapy + Control Auriculotherapy.
Results expressed as median (Minimum value - maximum value). ⊠ p= comparative analysis between the three groups.
Source: Prepared by the authors, 2020.

state and cognitive capacity, especially in university students. (3,6-7,20-21) Pain tends to aggravate the feeling of disability when it affects individuals of working age and economically active (18), this condition is similar to the case of the participants in the present study, whose mean age was 32.97(± 9.74) years.

The appearance of nonspecific acute low back pain in an academic environment can be triggered by several factors considered intrinsic (individual's health condition) and extrinsic (external factors), that is, overweight, sedentary lifestyle, weakened musculature, ergonomically inadequate position, among others, in addition to stressful conditions caused by academic work, such as internships, classes, among others. (1,21)

In the present study, 88.9% of the participants were undergraduates, more than 55.6% had an employment relationship and 89% were undergoing clinical internships (as a professor or student) and/or involved in practical disciplines, whose set of activities required adequate posture on furniture, prolonged exposure to a certain position, in addition to adaptation to the university's work routine. This information converges with studies that point to the incidence of low back pain, caused by mechanical and bodily resistance, to posture adjustments to furniture for a prolonged period of time. (22-23)

Adjustments in everyday life to re-



Graph 1 - Total low back pain questionnaire score according to sample groups, 2020.
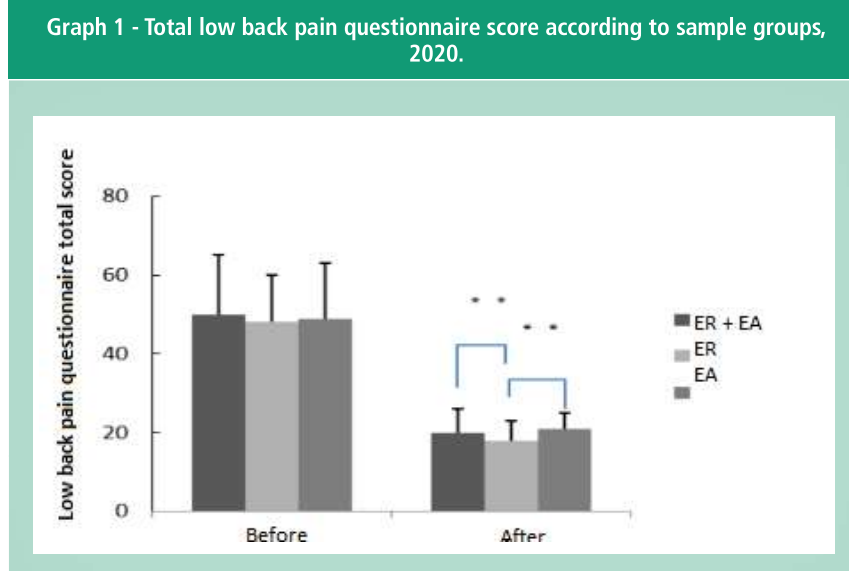
EA = experimental auriculotherapy + control reflex therapy.
ER+EA = Experimental Reflexotherapy + Experimental Auriculotherapy.
ER = Experimental Reflexotherapy + Control Auriculotherapy.
** p< 0.001.
Source: Own work results, 2020.

concile the daily demand for academic activities can favor the triggering of emotional and mental disorders; lead to fatigue; to stress and generate pain in the lumbar region, from disturbance in the immune system and tissue damage. (3,13,18,21) Adjustments in everyday life to reconcile the daily demand for academic activities can favor the triggering of emotional and mental disorders; lead to fatigue; to stress and generate pain in the lumbar region, from disturbance in

the immune system and tissue damage (6,20), 71.4% of the participants in this study performed regular physical activity and, even so, had nonspecific acute pain at the beginning of the investigation. With this, it is questioned whether the students' physical practice was the most adequate to promote the desired effects (5), or whether other conditions need to be investigated to understand the reason for such evidence.

It should be noted that the professors

in the study are also exposed to the same intrinsic and extrinsic factors as the students, however with other realities added to everyday life, among them: need for constant updating; academic productions and publications; carry out teaching, research, extension and administrative activities, and still have emotional resistance to deal with the responsibility of forming competent citizens in their profession. (2,4) In addition, the fact that all activities generally occur at the same time contributes to the wear and tear and appearance of low back pain. (22,24)

Given the negative impact of pain on the health of professors and students, it is understood that immediate intervention, with non-pharmacological practices, can improve musculoskeletal disability and kinesiophobia, in addition to reducing the evolution to subacute to chronic stages. (24) At the beginning of the research, the average pain intensity of professors and students, in the data obtained by the QL was 49.32 (±12.19) (p=0.435) and at the end (21 days later), it increased to 18 13( ±7.78), with statistical significance (p=<0.001) for intervention. In the VAS, the intensity of low back pain was moderate, obtaining a median of 5 (3-8), evolving to intensity between mild and absent, median 0 (0-3) at the end of the research, in a total period of 21 days. These results are in line with studies that encourage the use of non-drug therapies to reduce the consumption of opioids, analgesics and non-opioids, since medications are common protocol treatment methods for pain control, but which have undesirable side effects, which can lead to gastrointestinal and cardiovascular toxicity when used inappropriately. (12,20,25-27)

From the data obtained by the VAS instrument, after applying the reflex therapy and auriculotherapy protocols, it was found that, immediately after the first intervention, there was a significant difference (p=0.005) between the groups, showing slightly better results in the median pain intensity (before/after) after

application of the protocols: ER+EA (beginning 6(3-7) to 2(0-4) after) and ER+CA (5(3-8) ) to 1(0-3) later), when compared to the EA+ER group (from 5(3-8) to 2(0-4) after intervention). This result was similar to a study carried out at a university hospital in Santa Catarina, which identified the immediate effect of intervention with reflex therapy for occupational acute low back pain (p<0.001). (13)

Another study, which evaluated immediate results with non-drug intervention (shiatsu and auriculotherapy) for low back pain, showed that there were significant results immediately after practical interventions, promoting a change in pain from moderate to mild, which remained for seven days. (16) Based on this information, this discussion is brought up as a fact that opposes the result of the present study, since there was no permanence in the reduction of pain intensity after the first intervention. However, this result was similar to the clinical trial that evaluated immediate effects for low back pain with auriculotherapy intervention (28), identifying a slight increase in pain intensity between the 5th and 8th day, without statistical significance (p=0.046) in relation to the control. Another similarity was that the groups showed continuous improvement in pain intensity throughout the research interventions, even considering a slight increase in the first days.

When analyzing the results of the first and last day of the research, between the groups, a change in the intensity of moderate pain (median varying between 5 and 6 in the groups) to mild (median 1) or absence of pain (0) is observed. However, there was a statistical difference between the three groups (p=0.006) only for VAS data, confirming that the EA+RC protocol, whose final intensity 1(0-3) was mild, showed a less effective result at the end of the study in relation to the other groups that did not present pain, in the median ER+EA-0(0-1) and ER+CA-0(0-3).

It is understood that the less effective

result, although statistically significant, may be related to the fact that the auricular points were not stimulated by the participant, to avoid bias in the research. The lack of pressure on the points may have reduced the stimulus on the nerve endings of the ear, making it difficult for the central nervous system to release endogenous neurotransmitters, responsible for pain control. (25)

A systematic review considered that the average time of permanence with the seeds in the auricle should be a maximum of 7 days and that daily stimulation of one minute is necessary, or until the place becomes sensitive, to promote the neurophysiological effects. (25)

**CONCLUSION**

The present investigation showed that foot reflex therapy and auriculotherapy promoted an immediate and mediate effect in the reduction of nonspecific low back pain in professors and students, both combined and isolated, and the proposed hypothesis was accepted (H1). Even considering that the Experimental Auriculotherapy with Control Reflexotherapy group showed slightly lower efficacy when compared to the other groups (p=0.006) for VAS results, significant evidence from this study demonstrates that both practices can be recommended as safe non-drug interventions for pain management.

It is understood that the number of professors who joined the research was a limiting factor, since it generated restriction in discussions that could determine the specificity of the areas of activity, among other variables that are raised as gaps for investigation in scientific studies. Another limitation was the occurrence of unforeseen administrative, political, social and economic events at the institution, which altered the semester's schedule, both in terms of schedules and activities of professors and students, affecting the recruitment of participants.

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