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ORIGINAL ARTICLE

Auriculotherapy in nursing professionals during the coronavirus pandemic: a multiple case study

Auriculoterapia em profissionais de enfermagem na pandemia do coronavírus: estudo de casos múltiplos

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ABSTRACT

This study aimed to evaluate the levels of anxiety, depression and stress before and after an auriculotherapy session, in nursing professionals working during the coronavirus pandemic. Case study, with multiple cases and one unit of analysis. A convenience sample of 41 professionals was established. The sociodemographic characterization instrument and the Depression, Anxiety, and Stress Scale were applied before and after an auriculotherapy session with a 10-acupoint protocol. The Wilcoxon and t tests were paired for analysis. Anxiety, depression and stress levels showed significant results, the medians decreased from six to four (p<0.001), in the variables depression and anxiety, and the average stress decreased from 19.37 to 11.95 (p<0.001). Auriculotherapy was effective in reducing emotional disorders in nursing professionals.

Descriptors: Nursing; Depression; Anxiety; Stress, Psychological; Acupuncture, Ear.

RESUMO

Objetivou avaliar o efeito antes e depois de uma sessão de auriculoterapia nos níveis de ansiedade, depressão e estresse nos profissionais de enfermagem escalados para atuar na assistência durante a pandemia do coronavírus. Estudo de caso, com casos múltiplos e uma unidade de análise. Estabeleceu-se uma amostra por conveniência de 41 profissionais. Aplicou-se o instrumento de caracterização sociodemográfica e a escala de *Depression, Anxiety, and Stress Scale*, antes e após uma sessão de auriculoterapia com protocolo de 10 acupontos. Teste de Wilcoxon e T emparelhado foram empregados para análise. Níveis de ansiedade, depressão e estresse apresentaram resultados significativos, cujas medianas reduziram de seis para quatro (p<0,001), nas variáveis depressão e ansiedade, e a média de estresse reduziu de 19,37 para 11,95 (p<0,001). A auriculoterapia foi efetiva na redução de distúrbios emocionais nos profissionais de enfermagem.

Descritores: Enfermagem; Depressão; Ansiedade; Estresse Psicológico; Acupuntura Auricular.

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INTRODUCTION

Coronavirus (COVID-19) is a respiratory disease caused by the SARS-CoV-2 virus (Severe Acute Respiratory Syndrome Coronavirus). Infection began in the city of Wuhan, Hubei province, China, and the first report dates from December 2019[1]. On January 30, the epidemic was declared a Public Health Emergency of International Importance (ESPII) and, on March 11, the outbreak was labeled a pandemic[2].

In Brazil, to respond to respiratory emergencies, care measures such as the National Contingency Plan for Human Coronavirus Infection, (which has the purpose of containing human infection and reducing the development of severe infections and deaths) were adopted[3]. However, it was predicted that the pandemic could collapse the healthcare system due to the high transmissibility of the virus and the reduced number of beds in relation to the number of people infected[4].

Faced with fear of overcrowded hospitals, overload of services, frustration at the loss of patients and stress generated by anticipation of what was to come — which would involve the care of patients with confirmed or suspected contamination — it was predicted that the mental health of many frontline healthcare workers could suffer negative impacts[5].

Among healthcare workers, it is known that the most vulnerable are those who work in hospitals and Basic Health Units (*Unidades Básicas de Saúde* - UBS), and there are records of exhaustion, decreased empathy, irritability, insomnia and decreased work performance in this group[6].

Non-pharmacological techniques, such as auriculotherapy, have been considered effective in the literature for the treatment and relief of anxiety[7-8], depression[9] and stress[10], and can be effective in improving the health of these professionals.

Auriculotherapy consists of a technique that relies on Traditional Chinese Medicine (TCM) and collaborates in the psycho-organic regulation of the individual through the stimulation of energy points. These energy points are located in the ear, in which the entire organism is represented as a microsystem. Stimulation can occur through needles; steel, gold, silver, or plastic balls; or mustard seeds. This stimulation involves neurotransmitters, cytokines, the immune system, inflammation and neurological reflex[11].

It was assumed that, for nursing professionals who work on the frontlines in the current pandemic, auriculotherapy could favor energy balance, contributing positively both in physical, as well as social, emotional and spiritual aspects, as evidenced in the literature[12].

Due to having to cope with adversities in their professional lives, such as physical and emotional exhaustion, the nursing team may present emotional distress such as anxiety, depression and stress[13]. Therefore, it is relevant to plan and develop institutional support programs for these direct care workers during the coronavirus pandemic, collaborating in their personal wellbeing. We also emphasize the importance of using auriculotherapy as a simple, from a technological point of view, fast, low-cost technique and one that is easy to provide to workers, both in everyday circumstances and during catastrophes[12] and, at this moment, during the pandemic.

In this sense, the study aimed to assess the before and after effect of an auriculotherapy session on the levels of anxiety, depression and stress that affect nursing professionals who worked during the coronavirus pandemic.

METHODOLOGY

Type of study

This is a case study, with multiple cases and one unit of analysis: the effect of auriculotherapy on anxiety, depression and stress generated while caring for patients infected with coronavirus in a Public University Hospital in Belo Horizonte, Minas Gerais.

Population and sample

Individuals were selected according to the following established eligibility criteria: nursing professionals who were on duty at the time of the intervention, who were available to participate in the auriculotherapy session and who responded to the assessment before and after the intervention. Exclusion criteria were: presence of infection, inflammation or injury to the ear; use of ear piercing (except for regular earrings) or allergy to microporous tape; pregnant, being in puerperium and/or breastfeeding.

The population consisted of 105 professionals from the nursing team scheduled to assist patients suspected of having a coronavirus infection in the institution. The sample was one of convenience, composed of those who were interested in receiving the auriculotherapy intervention. Through the invitation made to all professionals who met the inclusion criteria, 42 subjects, who signed an Informed Commitment Form (ICF), participated in the study. One individual, who did not respond to the final assessment, was dropped from the study. Thus, the sample consisted of 41 individuals (39%) who received the auriculotherapy intervention.

Instruments and variables

Two instruments were applied, the first for sociodemographic characterization. This involved information such as sex; age; marital status (single, married, in a domestic partnership, widowed or divorced); children (yes or no); religion (catholic, spiritist, protestant, atheist, agnostic or other); monthly income (minimum wage, two to three times the minimum wage, four to five times the minimum wage, six to seven times the minimum wage, eight to ten times the minimum wage, over 10 times the minimum wage); education

(nursing assistant, nursing technician, undergraduate nurse, graduate, master's or doctorate); length of service at the institution (years); workload (hours); number of jobs; work sector (open, closed or administrative/organizational sector); work shift (morning, afternoon, full-time or night); type of service (assistance or administrative/organizational); work autonomy (yes or no); good interpersonal relationships (yes or no); professional recognition (yes or no); job satisfaction (yes or no); job insecurity (yes or no); work overload (yes or no); perception of the general state of personal health (very good, good, regular, bad, very bad); alcohol use (yes or no); smoker (yes or no); sleeps well (yes or no); good family and social relationships and support (yes or no).

The second instrument was selected to measure the state of anxiety, depression and stress. The Depression, Anxiety, and Stress Scale-21 (DASS-21) was applied. It is based on the tripartite model that considers emotional disorder as being caused by continuous anxiety, depression and stress[14].

It is a self-applicable instrument. It was translated and validated in Brazil[14] and presented good internal consistency with a total Cronbach alpha of 0.96; and an alpha for the Depression subscale of 0.93, Stress of 0.91, and Anxiety of 0.86 [14]. The scale consists of three subscales in order to assess symptoms over the past week through seven questions, with four answers for each question (0 = Did not apply to me at all; 1 = Applied to me to some degree or some of the time; 2 = Applied to me to a considerable degree or a good part of the time; 3 = Applied to me very much or most of the time). The sum of each subscale multiplied by two provides the final DASS-21 score.

Through the scale, the levels of anxiety, depression and stress can be classified as normal, low, moderate, severe and extremely severe. The cutoff points for depression are: 0-9 (normal); 10-13 (low); 14-20 (moderate); 15-19 (severe); and ≥ 20 (extremely severe). Anxiety can be classified as normal (0-7); low (8-9); moderate (10-14); severe (15-19); and extremely severe (≥20). Stress is considered normal between zero and 14, low between 15 and 18, moderate between 19 and 25, severe between 26 and 33 and extremely severe starting at 33 points[14].

Procedures for data collection and application of auriculotherapy

After the instruments were self-completed, the nursing professionals received an auriculotherapy session[15]. Fifteen days after the intervention[16], in order to evaluate the effect of the session, the DASS-21 was applied again, via telephone. The researcher asked the questions, offered the possibilities of answers and recorded them for the purpose of scoring on the scale.

The intervention was carried out by three professionals, one of whom was a student and the other two were trained in nursing, all of whom were qualified in auriculotherapy and had clinical experience for assistance with the diagnosis of anxiety, depression and stress, prescription and execution of auriculotherapy using a protocol of auricular points.

The treatment protocol was based on a previous study[17] and on the practical experience of researchers in the area of auriculotherapy. Thus, the following auricular points were established: *Shen Men*, Kidney, Sympathetic Nervous System (SNV), Joy, Anxiety, Antidepressant, Heart, Endocrine, Lung and Muscle Relaxation.

For the auriculotherapy intervention, mustard seeds were used and fixed with microporous tape so that they remained in place for five consecutive days. Each participant was instructed to stimulate each acupoint three times a day, during the seven-day period, with the seeds remaining in the auricle. In the case of adverse symptoms such as pain, local bleeding, inflammation in the ear, nausea or dizziness, the professionals were advised to immediately inform the responsible researcher. The seeds were handled by means of anatomical forceps, which helped to apply them in the auricular pavilion.

The procedure lasted 10 minutes and was applied in an environment previously prepared for the execution of the therapy. The room had a sink for washing hands before each application and a comfortable chair, where the participants received the intervention. For the application, the person applying the technique used a sterile disposable apron, surgical mask, disposable cap and procedure gloves.

The health professional who received the intervention remained seated during the application. Antisepsis was performed with 70% rubbing alcohol on the entire ear, taking precautions to protect the ear canal by plugging it with a cotton pad. Then, the seeds were fixed in the acupoints listed in the protocol. Fifteen days after the intervention, at the time of the final assessment, individuals were asked if they had any adverse symptoms and whether the acupoints were manually stimulated, according to previous guidance. The responses were duly recorded, and those who reported not performing the manual stimulus were counted as a sample loss.

Ethical aspects

The study was approved by the Federal University of Minas Gerais under report number 3,660,664.

Data processing and analysis

The data were inserted into a database, using an electronic spreadsheet (Microsoft Office Excel®, version 2013). Double entry was performed in order to verify the consistency of the data. For the statistical analysis of the data, the software

Statistical Package for the Social Science (SPSS), version 20.0 was used.

The Shapiro-Wilk test was used to determine the normality of the data. Non-normal distribution was found in the variables, with the exception of the stress score, which presented normal distribution.

The descriptive analysis of the quantitative variables was presented through median and interquartile ranges (p25-p75) and the relative frequency for the categorical variables. For the analysis before and after the intervention, the Wilcoxon test was used to process the non-normal data and the paired *t*-test to analyze the stress levels. In order to verify the internal consistency of the DASS-21 instrument, Cronbach's alpha coefficient was used, which presented a result of 0.775, which is considered satisfactory[18]. A 95% confidence interval was adopted, with a margin of error of 0.05 points.

RESULTS

Sociodemographic and work characteristics of nursing professionals

The nursing team sample had an average age of 39 years (34.5-45). Sociodemographic characteristics are shown in Table 1.

As for work characteristics, the median time of service at the institution was five years (4-12) and the workload per day was six hours (6-12). It was observed that 76% or participants work one job. Regarding the work sector, 78% work in closed sectors; 65.9% work the morning shift; and 85.4% perform assistance activities.

Regarding psychosocial conditions at work, it was found that 75.6% reported having autonomy in the performance of their duties; 97.6% reported good interpersonal relationships; 73.2% felt recognized professionally; 78% felt professionally satisfied; and 53.7% did not feel insecure at work. However, 75.6% reported feeling overwhelmed at work.

Regarding the perception of the general state of personal health, 48.8% of the professionals considered themselves healthy, 58.5% reported not drinking alcohol and 92.7% were not smokers. Regarding sleep, 53.7% reported not sleeping well. Regarding family relations, 97.6% reported having a good relationship with their family members and 87.8% considered themselves as having good social support.

Table 1. Sociodemographic and work characteristics of nursing professionals. Belo Horizonte, MG, Brazil, 2020.

Sociodemographic characteristic		n	Percentage (%)
Sex	Female	35	85.4
	Male	6	14.6
Marital Status	Single	11	26.8
	Married/ domestic partnership	28	68.3
	Widowed	1	2.4
	Divorced	1	2.4
Children	Yes	29	70.7
	No	12	29.3
Religion	Catholic	23	56.1
	Spiritist	7	17.1
	Protestant	6	14.6
	Atheist	1	2.4
	Agnostic	3	7.3
	Other	1	2.4
Wage bracket (minimum wage base)	One	-	-
	Two to three	15	36,6
	Four to five	11	26,8
	Six to seven	13	31,7
	Eight to ten	-	-
	Over ten	2	2,9
Education	Nursing assistant	1	2,4
	Nursing technician	13	31,7
	Nursing undergraduate	7	17,1
	Graduate	18	43,9
	Master's	1	2,4
	Doctorate	1	2,4

Effect of the intervention

Table 2 shows the behavior of variables before and after the intervention. There was a reduction in the level of stress, from moderate, at the time of pre-intervention, to normal, after the auriculotherapy session. There was also a significant reduction in depression and anxiety observed in the median values. However, at the time of the pre-intervention, these variables were within the parameters of normality and remained so after the intervention.

Table 3 shows the frequency of individuals according to each level of the "outcome" variables before and after the intervention. There is a reduction in the frequency of professionals who presented moderate to extremely severe stress, anxiety and depression, before the intervention, to low and normal levels.

Table 2. Comparison before and after intervention in the levels of stress, anxiety and depression. Belo Horizonte, MG, Brazil, 2020.

	Stress Median (Standard Deviation)	p[1] Value	Anxiety Median (p25 - p75)	p[2] Value	Depression Median (p25 - p75)	p[2] Value
Pre-Intervention	19.37 (10.61)	**<0.001**	6 (4 -16)	**<0.001**	6 (2 - 12)	**<0.001**
Post-Intervention	11.95 (8.51)		4 (0 – 7)		4 (0– 6)	

Legend: [1] Paired t-test; [2] Wilcoxon.

Table 3. Frequency of individuals according to symptoms for the pre- and post-intervention variables anxiety, depression and stress. Belo Horizonte, MG, Brazil, 2020.

	Normal f (%)	Low f (%)	Moderate f (%)	Severe f (%)	Extremely Severe f (%)
Pre Stress	16 (38.9)	4 (9.8)	7 (17)	8 (19.5)	6 (14.6)
Post Stress	27 (65.7)	3 (7.3)	7 (17)	4 (9.7)	-
Pre Anxiety	23 (28.1)	1 (2.4)	5 (12.2)	6 (14.7)	6 (14.6)
Post Anxiety	31 (58)	2 (4.9)	5 (12.2)	2 (4.9)	1 (2.4)
Pre Depression	27 (66)	5 (12.2)	4 (9.7)	1 (2.4)	4 (9.7)
Post Depression	36 (87.8)	2 (4.8)	2 (4.8)	-	1 (2.4)

In the final evaluation, when asked about adverse effects, the professionals denied having any symptoms, as well as affirming that they stimulated the acupoints as instructed at the time of the intervention.

DISCUSSION

The auriculotherapy intervention had a significant positive effect on the anxiety, depression and stress perceived in the nursing professionals who worked on the frontline of the coronavirus pandemic. There was a reduction in the level of stress from moderate to the parameters considered normal. It is worth mentioning that other psychosocial factors, which could be interfering with this result, were not investigated in the present study and deserve further research to verify their association.

At the moment of the intervention, the professionals' feeling was of insecurity and fear in face of the unknown. In this sense, the intervention was offered as a strategy for containment and care for workers, respecting their individuality and acceptance regarding therapy.

The nursing team works in the prevention, treatment and rehabilitation of health disorders and seeks to guarantee quality care. However, there are tensions, conflicts, excessive workload, among other factors, which can contribute to the impairment of these professionals' emotional and physical health. These factors were intensified in the face of the coronavirus pandemic, favoring symptoms of emotional instability in these workers due to the fear of the unknown, of manifesting or transmitting the disease to people close to them, and of loneliness due to social isolation[19].

Thus, the frequencies in the levels of anxiety, stress and depression, determined in the present study, are similar to other findings that evidence these emotional dysfunctions in workers who worked on the frontline during the coronavirus pandemic. A survey conducted in China during the pandemic found that in a sample of 994 employees, including doctors and nurses, 22.4% had anxiety and depressive disorders classified as moderate; and 6.2%, disorders considered severe[20].

In this study, a reduction in the frequency of nursing professionals in relation to the level of anxiety was identified, which went from higher levels to lower levels after auriculotherapy. The intervention can be considered effective because, after its application, there was a reduction in the frequency of professionals who had an extremely severe degree of anxiety.

It is interesting to observe a clinical trial to verify the effect of auriculotherapy on the quality of life of nursing professionals at a hospital in Brazil that showed a significant reduction in anxiety among professionals who had auriculotherapy in the modality with needles[7]. It should be noted that, although the device used is different from that used in the present study,

the practice remains effective with the improvement in the levels of anxiety of nursing professionals.

In the evaluation, by the median value, a decline of two points was identified after the intervention in the levels of depression. This result corroborates with a quasi-experimental study that evaluated the effect of auriculotherapy on the depressed mood of nursing students. A reduction in depression was evidenced in 25% of students after four weeks of treatment with auriculotherapy[21].

There was a reduction in the level of extremely severe stress. This finding is corroborated in a quasi-experimental study to assess the effectiveness of auricular acupuncture on stress levels among nursing professionals working in a medium-complexity health institution. It was found that, at the end of the study, 80% of nursing assistants had no stress symptoms. In turn, in relation to nurses who, before the intervention, did not present stress (83.3%), at the end of the research period they did not manifest symptoms of the problem (100%). It is important to highlight the professionals' report that the intervention favored a feeling of professional appreciation[22].

A randomized clinical study also evaluated the intervention of auriculotherapy to reduce stress levels in professionals from the same nursing team. The team was randomized into three groups: those who received the intervention through a pre-established protocol; those who received an individualized intervention, that is, without the standardization of a protocol as appropriate according to the principles of TCM; and a control group. Both groups that received auriculotherapy showed a significant reduction in the stress index and improved quality of life. Through the statistical analysis, a "large effect" (Cohen's d index of 0.79) was evidenced in the group that received the intervention through the protocol. However, the individualized technique showed a "very large effect" (Cohen's d index of 1.15). Thus, it appears that auriculotherapy applied in an individualized manner is more effective and can better meet the specific demands of each person according to the level of stress and comorbidities[23].

With regard to the number of auriculotherapy sessions, in the present study, satisfactory results were found with only one session, while in the literature there is no consensus on the time, number of sessions or specific treatment protocol to be used. A variation between eight[16] and 12 weeks[23] of therapy is identified.

In turn, the literature presents studies that compared the effectiveness between the use of needles and seeds in the auriculotherapy procedure. It was found that the technique performed with a needle provides a greater and more prolonged effect in a shorter period of time compared to the technique that uses seeds[16,24], although it has been pointed out that the application of the technique with a needle can cause greater discomfort and difficulty in maintaining needles in the auricle[16].

The auriculotherapy technique can be considered safe, given that there was no record of adverse events perceived by the research subjects. The literature corroborates this finding. In a systematic review, no serious adverse events such as death, hospitalization, disability, permanent damage or life-threatening situations related to auriculotherapy were recorded. Among 1,266 patients analyzed, in 17 studies, that used auriculotherapy with seeds, only 63 subjects presented skin irritation; 16, sensitivity or pain at the auricular points; and 18 individuals manifested a skin lesion at the location of seed fixation. Even so, it is possible to affirm that the technique is safe since the adverse events most frequently reported, were limited to short-term, mild and tolerable reactions[25].

Thus, auriculotherapy can contribute to reducing the levels of anxiety, depression and stress of nursing professionals. It is considered a valuable therapy, since these professionals experience stressful situations in their clinical practice, especially during this pandemic period, when they are providing direct care for a still unknown disease. In addition, these emotional dysfunctions can affect the productivity of these workers, which can negatively impact the care provided[26].

Some limitations of this study must be considered. The application of a fixed intervention protocol is not supported by the guidelines established by TCM, although positive results have been found. The therapy being performed in a single auriculotherapy session can be a limiting factor, since the literature supports a greater number of sessions to support its effectiveness. There was also a certain degree of difficulty for nursing professionals to leave their workstations to go to the place where the intervention was being performed.

In this sense, the development of studies with longer therapy time and a greater number of sessions to better observe the behavior of the variables is suggested, as well as the use of an individualized protocol and the choice of devices that do not depend on the indirect collaboration of the subjects involved.

The present study points out the potential of auriculotherapy in the treatment of emotional disorders such as anxiety, depression and stress among nursing professionals working on the frontlines of care, especially in this peculiar pandemic situation. The intervention can both collaborate for the worker's health and also be a strategy to help nursing professionals better care for their patients.

CONCLUSION

In just one session of auriculotherapy with seeds, significant reductions were obtained in the level of stress and in the median scores of anxiety and depression of the nursing professionals who worked on the frontline of the coronavirus pandemic. The protocol used was sufficient to

obtain improvement in the emotional disorders surveyed among professionals, with statistical significance observed between the levels before and after therapy.

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