EFFECTIVENESS OF AURICULOACUPUNCTURE ON THE SLEEP QUALITY OF WORKING NURSING PROFESSIONALS DURING THE COVID-19 PANDEMIC

Geórgia Alcântara Alencar Melo[1]
José Cláudio Garcia Lira Neto[1]
Renan Alves Silva[2]
Marina Guerra Martins[1]
Francisco Gilberto Fernandes Pereira[3]
Joselany Áfio Caetano[1]

[1]Universidade Federal do Ceará, Programa de Pós-graduação em Enfermagem. Fortaleza, Ceará, Brasil.
[2]Universidade Federal do Espírito Santo, Centro Universitário do Norte do Espírito Santo. São Mateus, Espírito Santo, Brasil.
[3]Universidade Federal do Piauí. Picos, Piauí, Brasil.

ABSTRACT

Objective: to evaluate the effectiveness of auriculoacupuncture in improving the sleep quality of nursing professionals in the fight against the COVID-19 pandemic.

Method: quasi-experimental before and after study, without a control or matching group performed from May to July 2020, in a referral hospital for infectious diseases in Ceará. The sample consisted of 26 nursing professionals, including nurses and technicians, who performed three sessions of auriculoacupuncture, once a week, for four weeks. Sleep quality was measured by the Pittsburg Sleep Quality Index. The effects of the intervention were analyzed by the student's "t" test to compare means between the first and last application, one-way ANOVA with repeated measures and post-hoc Sidak's test.

Results: regarding the components of the Pittsburg Sleep Quality Index, significant differences were observed between the individuals in the components: subjective sleep quality (p=0.001); sleep latency (p<0.001), sleep duration (p<0.001), habitual sleep efficiency (p=0.011), sleep disorders (p<0.001), sleeping medications (p=0.005) and excessive daytime sleep sleepiness (p<0.001). The overall sleep index also changed significantly (p<0.001). The intervention reduced the sleep quality index score by 52.35%.

Conclusion: the changes that occurred were able to change the category in sleep classification through a detailed decrease in the Pittsburg Sleep Quality Index scores. Significant differences were observed between the first and final moments in the global index and in all components.

DESCRIPTORS: Auriculoacupuncture. Coronavirus infections. Pandemic. Sleep. Human nursing resources in the hospital.

EFETIVIDADE DA AURICULOACUPUNTURA NA QUALIDADE DO SONO DE PROFISSIONAIS DE ENFERMAGEM ATUANTES NA COVID-19

RESUMO

Objetivo: avaliar a efetividade da auriculoacupuntura na melhora da qualidade do sono de profissionais de enfermagem atuantes no combate à pandemia da COVID-19.

Método: estudo quase-experimental, sem grupo controle ou pareamento, do tipo antes e depois, desenvolvido de maio a julho de 2020, em um hospital de referência para doenças infecciosas no Ceará. A amostra foi constituída por 26 profissionais de enfermagem, entre enfermeiros e técnicos, que realizaram três sessões de auriculoacupuntura, uma vez por semana, durante quatro semanas. A qualidade do sono foi mensurada pelo Índice de Qualidade do Sono de Pittsburg. Os efeitos da intervenção foram analisados pelo teste de "t" de student para comparação de médias entre a primeira e a última aplicação, ANOVA de uma via com medidas repetidas e teste pós-hoc de Sidak.

Resultados: no tocante aos componentes do Índice de Qualidade do Sono de Pittsburg foram verificadas diferenças significativas entre os indivíduos nos componentes: qualidade subjetiva do sono (p=0,001); latência do sono (p<0,001), duração do sono (p<0,001), eficiência habitual do sono (p=0,011), distúrbios do sono (p<0,001), medicamentos para dormir (p=0,005) e disfunção diurna do sono (p<0,001). O índice global do sono também teve mudança significativa (p<0,001). A intervenção reduziu em 52,35% a pontuação do índice de qualidade do sono.

Conclusão: as mudanças ocorridas foram capazes de mudar a categoria na classificação do sono por meio de uma queda circunstanciada nos escores do Índice de Qualidade do Sono de Pittsburg. Observaram-se diferenças significativas entre os momentos inicial e final no índice global e em todos componentes.

DESCRITORES: Acupuntura auricular. Infecções por coronavírus. Pandemia. Sono. Recursos humanos de enfermagem no hospital.

EFECTIVIDAD DE LA AURICULOACUPUNTURA SOBRE LA CALIDAD DEL SUEÑO DE PROFESIONALES DE ENFERMERÍA QUE ACTÚAN EN COVID-19

RESUMEN

Objetivo: evaluar la efectividad de la auriculopuntura en la mejora de la calidad del sueño de los profesionales de enfermería que trabajan para combatir la pandemia de COVID-19.

Método: estudio cuasiexperimental, sin grupo control ni pareado, del tipo antes y después, desarrollado de mayo a julio de 2020, en un hospital de referencia por enfermedades infecciosas en Ceará. La muestra estuvo conformada por 26 profesionales de enfermería, entre enfermeros y técnicos, quienes realizaron tres sesiones de auriculoacupuntura, una vez por semana, durante cuatro semanas. La calidad del sueño se midió mediante el índice de calidad del sueño de Pittsburg. Los efectos de la intervención se analizaron mediante la prueba "t" de Student para comparar medias entre la primera y la última aplicación, ANOVA unidireccional con medidas repetidas y prueba post-hoc de Sidak.

Resultados: con respecto a los componentes del Índice de Calidad del Sueño de Pittsburg, se encontraron diferencias significativas entre los individuos en los componentes: calidad subjetiva del sueño (p = 0,001); latencia del sueño (p <0,001), duración del sueño (p <0,001), eficiencia habitual del sueño (p = 0,011), trastornos del sueño (p <0,001), medicamentos para dormir (p = 0,005) y disfunción del sueño durante el día (p <0,001). El índice general de sueño también cambió significativamente (p <0,001). La intervención redujo la puntuación del índice de calidad del sueño en un 52,35%.

Conclusión: los cambios que ocurrieron pudieron cambiar la categoría en la clasificación del sueño a través de una caída sustancial en las puntuaciones del Índice de Calidad del Sueño de Pittsburg. Se observaron diferencias significativas entre los momentos inicial y final en el índice global y en todos los componentes.

DESCRITORES: Acupuntura auricular. Infecciones por coronavirus. Pandemia. Sueño. Recursos humanos de enfermería en el hospital.

INTRODUCTION

The SARS-CoV-2 virus, responsible for causing a severe acute respiratory syndrome, called COVID-19, has caused physical and psychological consequences to the world population, especially those of the risk groups and professionals working on the front line of health care, given the exhaustive exposure and harmful consequences caused by viral manifestation.[1–3] Studies prove that the appearance of the new coronavirus can trigger, among other physical disorders, anxiety, fear, depressive symptoms, changes in the circadian cycle, *delirium* and sleep pattern disorders.[2–4]

In addition, these factors can be worsened in health workers when added to physical exhaustion, high workload, lack of personal protective equipment, inadequate working conditions, need to make ethically complex decisions about the care rationing, emotional tensions and critical patient care, which already occurred even before the SARS-CoV-2 outbreak, since it is closely linked to nursing practice. In addition, personal aspects linked to the anxieties generated by social isolation and changes in family routine have also collaborated to accentuate the context in which these professionals are inserted, which may put the safety of these professionals and patients at risk.[5–7]

In this sense, among the coping strategies for occupational stress, anxiety, mood and sleep disorders, auriculoacupuncture is highlighted.[8] This therapy has shown a promising effect in practice in mitigating problems related to disasters, epidemics or pandemics, establishing itself as a possible intervention that can be used in frontline health professionals during the COVID-19 pandemic, in an attempt to improve sleep patterns and stress control.[9]

Based on this, the hypothesis that this study intended to test was the following: auriculoacupuncture is effective for improving the quality of sleep of nursing professionals working during the COVID-19 pandemic. Therefore, the interest in studying this issue is justified, since the current scenario exposes professionals to situations that negatively influence the sleep pattern, compromising the care provided and the worker's quality of life. Thus, the objective of this study was to evaluate the effectiveness of auriculoacupuncture in improving the quality of sleep of nursing professionals working in the COVID-19 pandemic.

METHOD

This is a quasi-experimental before and after type study, without control group or pairing, conducted in a reference infectious diseases hospital in the State of Ceará, from May to July 2020. The study followed the recommendations of the Standard Protocol Item: recommendations for interventional trials (SPIRIT).

The population consisted of nursing team professionals represented by nurses and nursing technicians. The option to prioritize these professionals was due to the emergence of the pandemic and its consequences on the sleep quality of these professionals who work continuously in patient care.

Consecutive non-probabilistic sampling for convenience was used in the study as a recruitment strategy and the sample consisted of 39 professionals who started the protocol.

The study population consisted of 104 nursing professionals and the sample was determined according to the calculation for quasi-experimental studies, with a bilateral significance level of 95%, power of 80%, sample size ratio of 1 and the prevalence ratio of individuals who decided to undergo the intervention by the total number of individuals who finalized the protocol was 42%, requiring at least 17 individuals in the intervention.[10] However, 26 professionals completed this study protocol. A number of professionals discontinued due to a medical certificate related to COVID-19.

Workers of both sexes were included, who worked in the departments considered frontline in the fight against COVID-19: Intensive Care Unit (ICU), Emergency Department (ED) and Medical Wards (MW). Those who were not actively working for any reason were excluded. Professionals considered good sleepers (PSQI≥5) were also excluded, since the study sought to perform an intervention to improve sleep quality.

This study used auriculoacupuncture as an intervention product. The auriculoacupuncture sessions occurred in an approximately 20 minutes, in a room provided by the hospital itself, with adequate lighting and ventilation, and the pre-established protocol for ear points was used.[11–12] At this time, the exposure of the ear pavilion was requested and antisepsis with alcohol 70% was performed so that the crystal spheres (neutral spheres) were applied at the nine points selected for this study, according to the auricular map of the Chinese school, which were: Shen men, Kidney, Sympathetic Autonomic, Heart, Lung, Subcortex, Endocrine, Point zero or Muscle and Adrenal relaxation or tranquilizer. These ear points demonstrate effects on sleep, as already tested in previous studies.[11–12]

The study protocol followed the following steps:

1) An invitation was sent *via* WhatsApp by the nursing management to the entire hospital staff included in the sample with information about the day, time and place of the application;

2) To those who attended, an attendance list was made available by the nursing management to verify the attendance of the professionals. In addition, the professionals answered a socio-professional questionnaire about sleep quality (T0) and the first session of auriculoacupuncture was performed in this first meeting. This same questionnaire was answered three other times (T1, T2 and T3), always preceding the auriculoacupuncture sessions. Thus, each time after baseline (T0) corresponds to one week after this period, i.e., T1 corresponding to the first week after baseline and T3 to the third week after baseline. The visits occurred through prior scheduling, always on the same day of the week (Wednesday), which allows us to affirm that the points were in the auricula for seven days. In total, three sessions of auriculoacupuncture were performed for four consecutive weeks, once a week in each professional.

The data collection instrument was subdivided into: sociodemographic evaluation and sleep quality. The sociodemographic data contained nine questions about gender, age, profession, function, length of service, weekly workload, work shift, and work department. Sleep quality was measured by the Pittsburg Sleep Quality Index (PSQI).

The PSQI is a self-applicable tool,[13] validated in Brazil,[14] used to assess sleep quality and possible disorders in the previous month. The questionnaire is widely used in several populations, including nursing professionals, and has already been translated and validated into different languages. The instrument contains 19 questions and is integrated by seven components of sleep: subjective quality, latency, duration, efficiency and sleep disorders, use of sleeping medication and excessive daytime sleepiness, which result in a score corresponding to the subjective overall quality of sleep. The overall score is determined by the sum of the seven components, each of which receives a score established between zero and three points with the same weight, in which the three reflects the negative end of the scale ranging from zero to 21 points. Scores above five points indicate poor quality sleep.[13–15]

The statistical analysis of the data was performed using version 23 of the SPSS program in order to define the variables of the results as absolute frequency, dispersion measures and central tendency. The level of significance adopted was 5% and the confidence interval was 95%. To verify the level of sleep quality, the student and Mann Whitney "t"" test were performed in order to compare the means between the first and last application, verifying the effectiveness of the intervention. And a one-way ANOVA with repeated measures *and post-hoc* Sidak test were performed to measure whether the differences between moments were significant.

The research received approval from the Research Ethics Committee and complied with all ethical precepts set out in Resolution N°. 466/12 of the National Health Council (CNS).

RESULTS

Most nursing workers were female (24; 92.3%), mean age 39.11 (±12.09) years; nursing technicians (16; 61.5%), with a predominance of work in the morning shift (17; 65.4%); worked in intensive care units (13; 50.0%); with a service time of 175.76 (±149.69) in months and a workload of 49.96 (±12.72) hours per week. The extra hours worked is related to the extra hourly workload due to the demand caused by the COVID-19 pandemic.

Regarding the PSQI, it was observed that the general index showed significant mean differences in individuals who performed auriculoacupuncture at all times of treatment, with a significant reduction after the second evaluation. Significant differences were observed regarding the components of the PSQI, between individuals in subjective quality at all times; as well as sleep latency, sleep duration, habitual efficiency, sleep disorders, sleeping medications and daytime dysfunction, both on T1 and T2 (Table 1).

Table 1 – Means, standard deviation and Student's t-test according to each assessment and the respective sleep components in nursing professionals. Fortaleza, CE, Brazil, 2020. (n=26)

Pittsburg Sleep Quality Index Components	Baseline		T1*		T2†		T3‡	
	Average (standard deviation)	p-value	Average (standard deviation)	p-value	Average (standard deviation)	p-value	Average (standard deviation)	p-value
Subjective quality of sleep	1.57 (0.70)	<0.001	1.42 (0.70)	<.001	0.96 (0.44)	<0.001	0.38 (0.49)	0.001
Sleep latency	1.57 (0.85)	<0.001	1.57 (0.90)	<0.001	1.11 (0.65)	<0.001	0.96 (0.52)	<0.001
Sleep duration	1.73 (0.82)	<0.001	1.42 (0.90)	<0.001	1.11 (0.65)	<0.001	0.73 (0.53)	<0.001
Habitual sleep efficiency	0.53 (0.90)	0.006	0.26 (0.53)	0.016	0.23 (0.42)	0.011	0.23 (0.42)	0.011
Sleep disorder	1.96 (0.44)	<0.001	1.65 (0.56)	<0.001	1.53 (0.58)	<0.001	1.03 (0.59)	<0.001
Sleeping medication	0.69 (1.08)	0.003	0.69 (1.12)	0.004	0.53 (0.90)	0.006	0.38 (0.63)	0.005
Excessive daytime sleepiness	1.69 (0.78)	<0.001	1.46 (0.90)	<0.001	1.26 (0.82)	<0.001	1.00 (063)	<0.001
Global Pittsburg Sleep Quality Index	9.76 (2.97)	<0.001	8.50 (3.67)	<0.001	6.76 (2.48)	<0.001	4.65 (1.93)	<0.001

Note: *moment leading up to the second session; †the moment preceding the third session; ‡the moment preceding the fourth session.

Thus, the difference in the percentage of means between moments T0 and T3 showed an improvement of 75.8% in subjective quality; 57.8% in sleep duration; 56.6% in habitual efficiency; 52.5% in sleep disorders; 55.0% in the reduction of sleeping medications. Improvement results were found in 37.5% in sleep latency and 49.2% in daytime dysfunction. Thus, it can be affirmed that the intervention had the capacity to improve four components of the PSQI by more than 50.0% demonstrating impairment in other components such as the onset of sleep and naps during the day.

Auriculoacupuncture was able to reduce the sleep duration score by about 0.307 between T1 and T0. Between T2 and T1, significant statistical differences were observed between the scores of subjective quality, sleep latency, sleep duration, use of sleeping medications and in the total PSQI (Table 2).

Regarding T3 and T2, there were significant differences in the scores of the components: subjective sleep quality, sleep duration, reduction of sleep alterations, use of sleeping medications and total PSQI. Comparing the last and first moment, there was a reduction in the scores in the components: subjective sleep quality, sleep latency, sleep duration, sleep changes, excessive daytime sleepiness and total PSQI. Thus, it was not possible to observe statistically significant differences in habitual efficiency or excessive daytime sleepiness dysfunction. Thus, it is appropriate to point out that the intervention demonstrates effect in at least four components over a period of 14 days (T2) maintaining this minimum until the end of the protocol under study (Table 2).

Table 2 – Differences between the evaluations and the paired t-test of sleep components and the total index in nursing professionals during the peak of the pandemic. Fortaleza, CE, Brazil, 2020 (n=26).

Differences between evaluations	Auriculoacupuncture			
	Difference of means	Standard error	95% Confidence Interval	p-value
Total				
Baseline – T1*	- 1.269	0.66	+ 0.10 – 2.64	0.690
T1* – T2[†]	- 1.730	0.32	+ 1.05 – 2.40	<0.001
T2[†] – T3[‡]	- 2.115	0.26	+ 1.57 – 2.65	<0.001
T3[‡] – *Baseline*	- 5.115	0.53	+ 4.01 – 6.21	<0.001
Subjective quality of sleep				
Baseline – T1*	- 0.153	0.15	- 0.16 – 0.47	0.327
T1* – T2[†]	- 0.461	0.09	+ 0.25 – 0.66	<0.001
T2[†] – T3[‡]	- 0.576	0.11	+ 0.34 – 0.81	<0.001
T3[‡] – *Baseline*	- 1.192	0.15	+ 0.86 – 1.51	<0.001
Sleep latency				
Baseline – T1*	0.000	0.12	- 0.25 – 0.25	1.000
T1* – T2[†]	- 0.461	0.13	+ 0.17 – 0.74	0.003
T2[†] – T3[‡]	- 0.153	0.09	- 0.03 – 0.34	0.103
T3[‡] – *Baseline*	- 0.615	0.16	+ 0.27 – 0.95	0.001
Sleep duration				
Baseline – T1*	-0.307	0.14	+ 0.10 – 0.60	0.043
T1* – T2[†]	- 0.307	0.10	+ 0.08 – 0.52	0.008
T2[†] – T3[‡]	- 0.384	0.12	+ 0.12 – 0.64	0.005
T3[‡] – *Baseline*	- 1.000	0.15	+ 0.67 – 1.32	<0.001
Habitual sleep efficiency				
Baseline – T1*	- 0.269	0.21	- 0.18 – 0.71	0.230
T1* – T2[†]	- 0.038	0.03	- 0.40 – 0.11	0.327
T2[†] – T3[‡]	0.000	-	-	-
T3[‡] – *Baseline*	- 0.307	0.20	- 0.11 – 0.73	0.147
Sleep disorders or disorders				
Baseline – T1*	- 0.307	0.12	+ 0.05 – 0.55	0.180
T1* – T2[†]	- 0.115	0.06	- 0.16 – 0.24	0.083
T2[†] – T3[‡]	- 0.500	0.11	+ 0.26 – 0.73	<0.001
T3[‡] – *Baseline*	- 0.923	0.13	+ 0.64 – 1.20	<0.001

Table 2 – Cont.

Differences between evaluations	Auriculoacupuncture			
	Difference of means	Standard error	95% Confidence Interval	p-value
Use of sleeping medications				
Baseline – T1*	0.000	0.29	- 0.61 – 0.61	1.000
T1* – T2†	- 0.153	0.07	+ 0.00 – 0.30	0.043
T2† – T3‡	- 0.153	0.07	+ 0.00 – 0.30	0.043
T3‡ – *Baseline*	- 0.307	0.23	- 0.17 – 0.78	0.200
Excessive daytime sleepiness				
Baseline – T1*	- 0.230	0.13	- 0.05 – 0.51	0.110
T1* – T2†	- 0.192	0.09	- 0.00 – 0.39	0.057
T2† – T3‡	- 0.269	0.08	+ 0.08 – 0.45	0.006
T3‡ – *Baseline*	- 0.692	0.13	+ 0.41 – 0.96	<0.001

Note: *moment leading up to the second session; †the moment preceding the third session; ‡the moment preceding the fourth session.

Thus, it was verified that the intervention was able to considerably reduce the total PSQI score by 52.35%, demonstrating significant differences, with adequate normal distribution between moments: T0 (KS: 1.019, p: 0.250); T1 (KS: 0.611; p: 0.850); T2 (KS: 0.602, p: 0.862) and T3 (KS: 1.458, p: 0.058) (Figure 1).
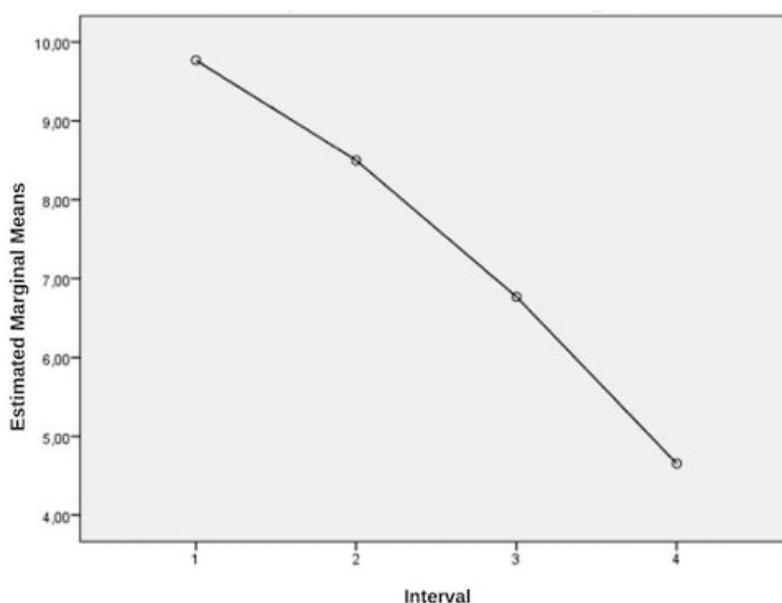
Figure 1 – Presentation of the behavior of the total PSQI index according to the moments of evaluation of auriculoacupuncture in nursing professionals during the peak of the pandemic. Fortaleza, CE, Brazil, 2020 (n=26).

There is a change in the category of sleep classification demonstrated by a detailed drop in PSQI scores over time with the application and maintenance of crystals in the nursing team at the peak of the pandemic, with extreme statistical significance. Thus, the one-way ANOVA with repeated measures demonstrated the effect of the intervention between the moments of the intervention on the PSQI [$F_{(1.83, 45.83)} = 39.938$; $p < 0.001$] influencing almost 40.0% of these values (Table 3).

Table 3 – ANOVA effect test of a pathway with repeated measures in the application of auriculoacupuncture in nursing professionals during the peak of the pandemic. Fortaleza, CE, Brazil, 2020. (n=26)

		Type III Sum of squares	Difference	Middle Square	F*	p-value	Square partial eta
Range	Greenhouse-Geisser	383.769	1.834	209.308	39.938	<0.001	0.615
	Lower limit	383.769	1.000	383.769	39.938	<0.001	0.615
Error (Range)	Greenhouse-Geisser	240.231	45.838	5.241			
	Lower limit	240.231	25.000	9.609			

Note: *intervention strength

The *post-hoc* Sidek test showed that only the T0 and T1 moment do not differ from each other (p=0.351). Thus, it is noted that the T2 intervals differs from T0, T1 and T3; and T3 differs from T0, T1, T2 with extreme significance (Table 4).

Table 4 – Comparisons between the application of auriculoacupuncture by means of the *post-hoc* Sidek test in nursing professionals during the peak of the pandemic. Fortaleza, CE, Brazil, 2020. (n=26)

(I) Range	(J) Range	Average difference (I-J)	Standard model	p-value	95% confidence interval for difference	
					Lower limit	Upper limit
Baseline	T1*	1.269	0.669	0.351	-0.642	3.180
	T2†	3.000	0.600	<0.001	1.286	4.714
	T3‡	5.115	0.536	<0.001	3.585	6.646
T1*	Baseline	-1.269	0.669	0.351	-3.180	0.642
	T2†	1.731	0.326	<0.001	0.800	2.662
	T3‡	3.846	0.456	<0.001	2.543	5.150
T2†	Baseline	-3.000	0.600	<0.001	-4.714	-1.286
	T1*	-1.731	0.326	<0.001	-2.662	-0.800
	T3‡	2.115	0.262	<0.001	1.367	2.864
T3‡	Baseline	-5.115	0.536	<0.001	-6.646	-3.585
	T1*	-3.846	0.456	<0.001	-5.150	-2.543
	T2†	-2.115	0.262	<0.001	-2.864	-1.367

Note: *moment leading up to the second session; †the moment preceding the third session; ‡the moment preceding the fourth session.

DISCUSSION

Sleep is intrinsically related to the restoration of neurobehavioral functions and homeostasis of the immune system. In addition, it is considered one of the mechanisms capable of reducing virus contamination and opportunistic diseases. When insufficient, it causes circadian cycle disorder, decreased melatonin secretion and has a strong relationship with the production of pro-inflammatory cytokines, negatively influencing the nursing care provided.[16]

The literature has evidenced harmful outcomes as a result of the current crisis in the sleep quality of nursing professionals and other healthcare workers. In China, a country that recorded the first cases of the new coronavirus (SARS-CoV-2), an investigation conducted with physicians and nurses highlighted a low sleep quality in these professionals in the first months of the pandemic with a PSQI score=8.58.[17] In Italy - one of the sites that encountered severe difficulties in controlling

the virus, one study showed that 68.3% of professionals who attended patients diagnosed with COVID-19 had episodes of insomnia during the peak of the virus.[18]

Living in the pandemic and not knowing several aspects related to this new situation, increases stress levels and health concerns, financial conditions, changes in social life and daily routine. Similarly, the scenario also elevates anxiety disorders, unpleasant thoughts and depressive symptoms, preventing the promotion of sleep.[19] When assessing psychological disorders, Chinese researchers point out that nurses have higher rates of anxiety, depression, insomnia and other mental problems when working in the context of COVID-19.[20]

The results evidenced in this research demonstrate the urgency for interventions that can minimize risks caused by the spread of SARS-CoV-2, especially in the sleep of professionals working on the front line in the fight against this disease. According to the outcomes found, after the application of auriculoacupuncture, all components of the PSQI had statistically significant attenuation in their scores, suggesting improvement in the sleep quality of the professionals evaluated. Regarding the comparison of the means of the PSQI components, the best results were linked to the quality and duration of sleep of the participants.

Studies that used acupuncture in an attempt to improve the sleep quality of different populations showed statistically significant results of this method in reducing sleep disorders.[11–12,21–22] These results are supported by other studies that showed positive outcomes of auriculoacupuncture therapy in the sleep quality of nursing professionals.[23] In the United States, acupuncture has proved to be popular and is on the list of the top 10 recommendations for insomnia, according to a survey conducted in private clinics in 2018.[24]

By regulating neurotransmitters and hormonal factors, auriculoacupuncture can modulate sleep and wakefulness and improve its quality[25], as demonstrated in a previous study[26], where it was found that five weeks of acupuncture treatment were associated with a significant nocturnal increase (p=0.002) of endogenous melatonin secretion (measured in urine) and significant improvements in polysomnographic measurements of sleep onset latency (p=0.003), excitation index (p=0.001), total sleep time (p=0.001) and sleep efficiency (p=0.002). Significant reductions in state (p=0.049) and trait (p=0.004) anxiety scores were also found.

In the same direction, a systematic review and meta-analysis, with 15 clinical trials, showed the benefits of auriculoacupuncture in all meta-analyses, with significant differences between the treatment and control groups. This practice not only decreased PSQI component scores, but also improved total sleep time and efficiency and reduced the incidence of adverse effects when compared to the usual anxiolytic, sedative and hypnotic psychotropic medications for sleep induction.[27]

The results presented here show that the use of sleep medications decreased significantly (p=0.005). Due to traumatic conditions experiences throughout life and professional careers, similar to those faced by health professionals in epidemics or deaths, U.S. military personnel commonly use these drugs for sleep control. Thus, a research conducted in an American military hospital showed that acupuncture not only reduced sleep disorders but was also able to reduce the occurrence of chronic pain in this population, compared to the usual treatment offered.[28]

Currently, despite the scarcity of studies that have used auriculoacupuncture for the treatment of sleep disorders in nursing professionals during the first months of the COVID-19 outbreak, different studies around the world have already indicated the beneficial effects of this therapy after large-scale disasters.[9] In an overview of reviews involving 34 systematic reviews with or without meta-analysis in several population groups, the efficacy of acupuncture to improve sleep quality by the PSQI was evaluated and found that the groups that used auriculoacupuncture had better sleep quality than the patients in the control group. However, despite the promising results, the authors stress the need to expand investigations on the subject given their low methodological quality.[29]

In this sense, a better analysis of component seven of PSQI is suggested, which concerns excessive daytime sleepiness. Despite the positive and statistically significant outcomes when comparing the auriculoacupuncture intervention in the nursing team before and after, in the first moments of application of this therapy the results were not as satisfactory as expected. The difficulties to sleep among workers who perform their duties per shift is relatively high, specifically for those who use the morning shift to resume sleep. In addition, the high burden of stress and the life behavior of each worker end up further impairing the quality of sleep.[23] It is important to emphasize that sleep disorders, psychological disorders or even Burnout syndrome are common among nurses, and are especially related to work positions. These factors increase individual and social adversities, reducing well-being and quality of life.[23]

Regarding the time of treatment, a study conducted with obese workers from a university hospital identified that eight sessions were effective in improving sleep quality ($p < 0.001$).[30] In other populations, auriculoacupuncture was also investigated for the benefits for insomnia and/or sleep quality in a two-week treatment at the Shenmen point, in 30 Taiwanese post-partum women with insomnia. They reported that the treatment of AA reduced the mean of PSQI women by 3.13 (from 8.7±2.26 to 5.57±2.37), reaching a significant difference before and after treatment.[31]

Thus, through the results found, it is assumed that auriculoacupuncture is an integrative and complementary health practice that deserves to be explored and can be recommended to professionals working on the front line of care for patients with COVID-19; not only during the duration of the pandemic, but also as a nursing intervention in workers' health. As it is economical and safe, with minimal adverse side effects, this therapy has significant potential to become corrective, rehabilitative or preventive with regard to sleep quality.

Therefore, this study offers significant perspectives for the health and nursing area, since the results indicate that this is an applicable and effective strategy in different scenarios, although bold and specialized. It is also highlighted that given the quality of therapy and the possible benefits, it is of interest to draw up cost-effectiveness investigations to elucidate the directions and implementations of this practice in health care services.

The main limitation of this study is the reduced generalization potential, since a causal association cannot be made as safely as it is in randomized controlled clinical studies. Another limitation was the sample being of convenience and small, which prevented the analysis of the effect of auriculoacupuncture on sleep quality, not counting the sample losses during the follow-up of this study due to the professionals being infected by SARS-CoV-2.

In addition, some confounding factors were not controlled, such as the use of other integrative and complementary practices, the number of participants' jobs, the use of controlled or discontinued medications, good sleepers, which may generate a result bias.

It is still important to mention that the absence of evaluation based on an objective result, such as polysomnography, may result in statistical bias in the evaluation result. As this is an unprecedented study in this context, it is impossible to compare it with other studies that may have been carried out in the same epidemiological context. Therefore, it is recommended that such limitations in future studies are minimized, so that there is validity that acupuncture is recommended to improve sleep quality, ensuring the external validity of the data, with caution.

CONCLUSION

This intervention was able to improve the subjective quality of sleep, sleep duration, habitual efficiency, reduction in sleep alterations and the use of sleeping medications dimensions by 50%. However, the intervention was not able to sustain better levels of sleep latency or excessive daytime sleepiness. Thus, it is noticed that after the application of three sessions of auriculoacupuncture over a period of four weeks, the nursing professionals evaluated showed improvement in sleep quality according to the PSQI.

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NOTES

CONTRIBUTION OF AUTHORITY
Study design: Melo GAA, Caetano JA.
Data collection: Melo GAA, Martins MG.
Data analysis and interpretation: Silva RA.
Discussion of the results: Silva RA, Lira Neto JCG.
Writing and/or critical review of the content: Pereira FGF, Melo GAA, Caetano JA.
Review and final approval of the final version: Silva RA, Lira Neto JCG, FGF Pereira, Melo GAA, Caetano JA.

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CORRESPONDING AUTHOR
Geórgia Alcântara Alencar Melo
georgiaenf@hotmail.com