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EFFICACY OF AURICULO THERAPY IN IMPROVING SLEEP QUALITY IN UNIVERSITY STUDENTS

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ABSTRACT

The research aimed to evaluate the quality of sleep in university students after intervention with Auriculotherapy. This is a convenience sample study composed of forty students from the initial periods of the bachelor's degree in Physiotherapy at the Centro Universitário Santo Agostinho. Four atrial acupuncture interventions were performed with metal spheres applied at the shenmen, heart, adrenal, and neurasthenia sites. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). For statistical analysis, the SPSS program was used in version 20.0. It was found that auriculotherapy was statistically effective in improving the sleep quality ($p < 0.001$) of the students when compared to the initial evaluation, in addition to that it improved significantly ($p < 0.05$) six of the seven components of the PSQI. Ear acupuncture with metallic spheres improved the sleep quality of college students, suggesting that therapy may have positive effects on sleep in these subjects.

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INTRODUCTION

One of the primary functions responsible for storing memory and for restructuring cerebral energy metabolism is satisfactory sleep (Cardoso, 2009). Not sleeping properly can be considered a chronic situation in the modern population (Silva, 2016), which can cause health damage such as increasing the prevalence of obesity, cholesterol high (Lee, 2017) and mental disorders (Schlarb, 2017). Feeling sleep during the day is becoming a common situation in society (Almeida, 2011), and this drowsiness results from poor sleep quality (Meyer, 2017). One of the publics most affected by this condition are university students who naturally suffer from changes in sleep patterns, due to the routine of studies, extracurricular activities, anxiety with the tests, living away from family members (Almeida, 2011).

Problems in sleep in students can dramatically influence academic achievement, in addition to which these individuals usually present chronic fatigue, depression, stress, feelings of pessimism, anxiety that lead to a decline in quality of life (Schlarb, 2017). In this regard the treatment for sleep disorders has been increasingly studied (Dobing, 2016 and Lund, 2016), in which non-pharmacological interventions have recently gained strength (Caldwell, 2009 and Hung, 2017), among which is auriculotherapy (Chueh, 2017). Auriculotherapy aims at the diagnosis and treatment of physical and psychosomatic dysfunctions stimulating specific points in the ear (Hou, 2015), this feature acts on reflex points of the auricular region, having the advantage of leading to few adverse effects and easy application (Reichmann, 2013). It has the principle of Western medicine and believes that man should be seen as a whole, without dissociating body, mind and spirit (Kurebayashi, 2012). Regarding the improvement of sleep quality, the effects of auricular therapy have not yet been well established (Hung, 2017).

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Table 1. Socio-demographic profile of Physical Therapy students at UNIFSA

Variable	N	%
Sex		
Male	9	22,5%
Female	31	77,5%
Age		
18 a 24 years	34	85,0%
25 years or more	6	15,0%

Source: UNIFSA Kinesiotherapy and Electrothermo-phototherapy laboratory.

Table 2. Sleep quality score by total PSQI score

Sleep quality and punctuation	Before treatment				p-value	
	Male		Female		Total	
	N	%	N	%	N	%
Good(0 a 4)	0	0,0%	2	5,0%	2	5,0%
Bad(5 a 10)	4	10,0%	20	50,0%	24	60,0%
Sleep disturbances(>10)	5	12,5%	9	22,5%	14	35,0%
	After treatment					
	Male		Female		Total	
	N	%	N	%	N	%
Good(0 a 4)	7	17,5%	23	57,5%	30	75,0%
Bad(5 a 10)	1	2,5%	7	17,5%	8	20,0%
Sleep disturbances(>10)	1	2,5%	1	2,5%	2	5,0%

*Significant value

Source: UNIFSA Kinesiotherapy and Electrothermo-phototherapy laboratory.

The purpose of this study is to evaluate the quality of sleep in physiotherapy students of a private institution after treatment with auriculotherapy.

MATERIALS AND METHODS

Study design and research site: An analytical and longitudinal intervention study was carried out with a quantitative approach performed in the Laboratory of Kinesiotherapy and Electrothermo-phototherapy of the University of St. Augustine (UNIFSA) in Teresina, state of Piauí, Brazil.

Population and Sample: The sample consisted of 40 volunteers, from the second to the sixth period of the Physiotherapy course, with inclusion criteria: age above 18 years, both sexes and students of the bachelor's degree in Physiotherapy from UNIFSA. We excluded pregnant women, people who experienced some discomfort (edema, auricular inflammation or nausea) during the auriculotherapy technique.

Ethical aspects: The study was approved by the Ethics and Research Committee of UNIFSA under the number of opinion 1,402,892, and is in accordance with the ethical criteria presented in Resolution 466/12 of the National Health Council. It was delivered and explained to all volunteers the Term Free and Informed Consent.

Evaluation protocol: A sociodemographic questionnaire was initially applied to all volunteers, followed by the Pittsburgh Sleep Quality Index (PSQI), a reliable instrument for assessing sleep quality, validated and translated into the Brazilian version (Bertolazi, 2011). PSQI issues form seven components: subjective quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping pills, and daily dysfunction, which are analyzed from the punctuation instructions of each of these components, ranging from zero to three points. The sum of the maximum score of this instrument is 21 points, with scores above five indicative points of poor quality in the sleep pattern (Bertolazi, 2011 and Buysse, 1989).

One week after the last day of intervention the PSQI was reapplied.

Intervention Protocol: During the intervention phase, each subject underwent auricular acupuncture per week for four weeks. Where it started with the hygiene of the auricular pavilion with cotton and alcohol 70%, small metallic beads were used with adhesive brand: DuxAcupuncture®; Dimensions: 7.5x10x5 (CxAxL), Card; Weight: 9g Material: Silver plated stainless steel to apply to specific external auricular points such as: shenmen located in the triangular pit, heart located in the inferior part of the ear, adrenal located in the trago, and point of neurasthenia located in the lobe. Points that are related to the Heart and capable of calming the spirit self-modulation of the functions of the internal organs and modulation of the autonomic nervous system¹⁷ Each week the metallic spheres were removed and replaced by others. The procedures took place between February and April 2017.

Statistical analysis

The data were tabulated and analyzed using SPSS software in version 20.0 version and converted into spreadsheets of the program Microsoft Excel 2010, for making graphs and tables. Relative and absolute frequencies and t-test (for paired samples) were used to analyze the level of significance before and after treatment. The values were considered statistically significant when p value <0.05 with a 95% confidence interval.

RESULTS

The socio-demographic profile of UNIFSA physiotherapy students is shown in Table 1, we observed that the majority of the volunteers were female (77.5%) and aged between 18 and 24 years (85%). Table 2 shows the comparison of sleep quality between the moments before and after the intervention with auricular acupuncture. A significant improvement (p <0.001) in sleep quality was observed. It is also observed that those considered good sleepers (score 0-4) increased by 70% after

Table 3. Components of PSQI according to before and after treatment with auriculoterapia in physical therapy students

Components of PSQI	Before treatment		After treatment		P-value
	N	%	N	%	
Sleep Quality					0,001*
Very Good	2	5,0%	9	22,5%	
Good	15	37,5%	28	70,0%	
Bad	16	40,0%	3	7,5%	
Too bad	7	17,5%	0	0,0%	
Sleep latency					0,001*
≤15	3	7,5%	14	35,0%	
16 - 30 min	8	20,0%	18	45,0%	
31 - 60 min	18	45,0%	6	15,0%	
>60 min	11	27,5%	2	5,0%	
Duration of sleep					0,001*
>7 hours	1	2,5%	10	25,0%	
6 a 7 hours	14	35,0%	22	55,0%	
5 a 6 hours	13	32,5%	6	15,0%	
<5 hours	12	30,0%	2	5,0%	
Sleep efficiency					0,003*
>85%	23	57,5%	33	82,5%	
75 a 84%	7	17,5%	5	12,5%	
64 a 74%	8	20,0%	2	5,0%	
<65%	2	5,0%	0	0,0%	
Sleep Disorders					0,002*
Not once	2	5,0%	14	35,0%	
Less than once a week	22	55,0%	25	62,5%	
1 to 2 times / week	16	40,0%	1	2,5%	
3 times / week or more	0	0,0%	0	0,0%	
Use of sleeping pills					0,160
Not once	33	82,5%	37	92,5%	
Less than once a week	4	10,0%	3	7,5%	
1 to 2 times / week	1	2,5%	0	0,0%	
3 times / week or more	2	5,0%	0	0,0%	
Dysfunction during the day					0,001*
Not once	3	7,5%	6	15,0%	
Less than once a week	9	22,5%	27	67,5%	
1 to 2 times / week	19	47,5%	7	17,5%	
3 times / week or more	9	22,5%	0	0,0%	

*Significant value

Source: UNIFSA Kinesiotherapy and Electrothermo-phototherapy laboratory.

the intervention. The PSQI components are shown in Table 3, the items subjective quality, sleep latency, sleep duration, sleep efficiency, sleep disorders and daily dysfunction show a significant decrease ($p < 0.05$) in the score after intervention with auriculotherapy, which indicates an improvement in the general sleep quality of university students.

DISCUSSION

In the present study, four auriculotherapy interventions at the shemen, heart, adrenal, and neurasthenia points were statistically effective in improving sleep quality compared to the time before treatment. Similar results were seen by Chueh *et al* (Chueh, 2017) in students at a university in Taiwan with the same time of approach and application. In another study (Zou, 2015) a comparison of atrial acupuncture was performed on specific acupoints (shemen, sympathetic autonomous, subcortex, heart and endocrine) and with placebo points during eight weeks of treatment in individuals who had insomnia and underwent hemodialysis, the results showed effectiveness in improving the quality of sleep in the individuals treated in the specific acupoints in relation to the placebo points. This positive action of auricular therapy can be explained by the regulation of melatonin (Hou, 2015), a pineal hormone that has maximum secretion at the moment when the human sleeps, it typically acts in coordination with the circadian rhythms to regulate the sleep function (Zhang, 2017). In the US military, auriculotherapy was effective in reducing symptoms of stress and insomnia, the author still emphasizes that the treatment was well accepted by the military, mainly because it is not a non-pharmacological

therapy (King, 2016). Something that is also reported by the university students of our study. In relation to sleep duration, there was a relative increase in the number of hours spent by the sample in our study. This is important since according to the American Academy of Sleep Medicine (AMERICAN ACADEMY OF SLEEP MEDICINE, 2005), for a person to have good quality sleep, the desired sleep time should coincide with the propensity for sleep commanded by the circadian rhythm. Among adults, the daily need for sleep varies from 5 to 8 hours, on average (Fernandes, 2006). In the initial evaluation, it was verified that the majority of the students in this study had poor sleep quality, corroborating with the study of Martini *et al*. (Martini, 2012), conducted in Physiotherapy students of a private teaching institution in Brazil with 199 individuals in which 51.75% of students had poor sleep quality. In another study, more than 60% of the Physiotherapy students of an institution in the Brazilian Amazon presented poor sleep (Lins, 2017).

In physical therapy students, the decrease in sleep quality can occur due to a shorter duration of sleep and the need to wake up earlier in class days, causing drowsiness during the day, a fact that impairs learning (Martini, 2012). The use of non-sleeping medication was the only PSQI item that did not show a significant difference after the intervention, this result may have been caused by the low number of students, less than 20%, who used sleeping medication prior to treatment. Another component of PSQI is sleep efficiency, which means the percentage in which an individual actually sleeps while in bed, 85% or more is considered normal (Fernandes, 2006). After treatment with auricular acupuncture, 30% of the sample

entered this normal range, in addition to the significant improvement ($p < 0.003$) in sleep efficiency after the therapeutic application of auricular acupuncture. The auricular therapy of our research was carried out with the use of small metal spheres, in the literature we see several other forms of this auditory stimulation such as seeds, magnetic stones, lasers, ultrasound, bleeding, moxibustion, electric treatment and pressure by hands (Hou, 2015). In the series of cases made by Yao Shuying, 46 patients with insomnia were treated in 12 low-power laser interventions with a wavelength of 820 nm, output power of 3 mw in atrial points. After a new reevaluation 32 cases were cured (able to sleep more than 7 hours) and 13 were improved (sleep between five and six hours) (Yao, 1999). A determinant factor in the quality of sleep may be anxiety, in the study by Almondes and Araujo (2003) in university students suggests that the trait of anxiety found in individuals negatively influences the sleep pattern, the relation sleep and anxiety is also seen in the academics of the last periods (Coelho, 2010). In our study a significant improvement in the quality of sleep in students of the Physiotherapy course of UNIFSA, demonstrated by a significant decrease in six PSQI scores. However, further studies are needed to address this issue.

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