

Original Article

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Auriculoterapia e Qigong Baduanjin sobre insônia e qualidade de vida em estudantes: estudo quase experimental

Auriculoterapia y Baduanjin Qigong sobre el insomnio y la calidad de vida en estudiantes: un estudio cuasi-experimental

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ABSTRACT

Objective: To evaluate insomnia and quality of life before and after auriculotherapy combined with Baduanjin Qigong, as well as university students' satisfaction with the intervention.

Method: This quasi-experimental, single-group, before-and-after, non-randomized study. Was conducted from November 2023 to April 2024 with 42 students from a public university in the state of Minas Gerais, Brazil. Four sessions of auriculotherapy and Baduanjin Qigong focused on insomnia and quality of life. Pre- and post-treatment assessments were performed using the Pittsburgh Sleep Quality Scale and the World Health Organization Quality of Life-Bref instruments. Satisfaction with the intervention was assessed. Descriptive and bivariate analyses were performed.

Results: The final mean of the evaluated scores were 5.66 ± 2.80 in insomnia, 68.45 ± 19.17 in the perception of quality of life, 60.11 ± 20.70 in satisfaction with health, 66.49 ± 13.26 in the physical domain and 54.36 ± 10.20 in the psychological domain. Of the participants, 42.90% demonstrated satisfaction with the intervention.

Conclusion: There was an improvement in insomnia and quality of life in university students after four sessions of auriculotherapy associated with Baduanjin Qigong.

Descriptors: Auriculotherapy; Qigong; Students; Sleep initiation and maintenance disorders; Quality of life.

RESUMO

Objetivo: Avaliar a insônia e qualidade de vida antes e depois da aplicação de auriculoterapia associada ao *Qigong Baduanjin* e a satisfação de estudantes universitários com a intervenção.

Método: Estudo quase experimental, do tipo de grupo único, antes e depois, não randomizado. Realizado de novembro de 2023 a abril de 2024, com 42 estudantes de uma universidade pública do estado de Minas Gerais, Brasil. Realizou-se quatro sessões de auriculoterapia e de *Qigong Baduanjin*, focadas na insônia e na qualidade de vida. Ocorreu uma avaliação antes e depois do tratamento pelos instrumentos Qualidade do Sono de *Pittsburgh* e *World Health Organization Quality of Life-Bref*. Investigou-se a satisfação com a intervenção. Foi realizada uma análise descritiva e bivariada.

Resultados: A média final dos escores avaliados foi de $5,66 \pm 2,80$ na insônia, $68,45 \pm 19,17$ na percepção da qualidade de vida, $60,11 \pm 20,70$ na satisfação com a saúde, $66,49 \pm 13,26$ no domínio físico e $54,36 \pm 10,20$ no domínio psicológico. Dos participantes, 42,90% demonstraram satisfação com a intervenção.

Conclusão: Evidenciou-se uma melhora na insônia e na qualidade de vida de estudantes universitários após quatro sessões de auriculoterapia associada ao *Qigong Baduanjin*.

Descritores: Auriculoterapia; Qigong; Estudantes; Distúrbios do início e da manutenção do sono; Qualidade de vida.

RESUMEN

Objetivo: Evaluar el insomnio y la calidad de vida antes y después de la auriculoterapia combinada con Baduanjin Qigong, así como la satisfacción de estudiantes universitarios con la intervención.

Método: Este estudio cuasiexperimental, de un solo grupo, de antes y después y no aleatorizado. Se realizó entre noviembre de 2023 y abril de 2024 con 42 estudiantes de una universidad pública del estado de Minas Gerais, Brasil. Se realizaron cuatro sesiones de auriculoterapia y Baduanjin Qigong enfocadas en el insomnio y la calidad de vida. Se realizaron evaluaciones pre y postratamiento utilizando la Escala de Calidad del Sueño de Pittsburgh y los instrumentos de Calidad de Vida Bref de la Organización Mundial de la

Salud. Se evaluó la satisfacción con la intervención. Se realizaron análisis descriptivos y bivariados.

Resultados: La media final de las puntuaciones evaluadas fue de $5,66 \pm 2,80$ en insomnio, $68,45 \pm 19,17$ en percepción de la calidad de vida, $60,11 \pm 20,70$ en satisfacción con la salud, $66,49 \pm 13,26$ en el dominio físico y $54,36 \pm 10,20$ en el dominio psicológico. El 42,90 % de los participantes se mostró satisfecho con la intervención.

Conclusión: Se observó una mejoría en el insomnio y la calidad de vida en estudiantes universitarios luego de cuatro sesiones de auriculoterapia asociada al Qigong Baduanjin.

Descriptor: Auriculoterapia; Qigong; Estudiantes; Trastornos del inicio y del mantenimiento del sueño; Calidad de vida.

INTRODUCTION

Sleep is understood as a natural and complex physiological process that aims to regulate, through the brain, the physiological functions of various systems of the human body, and is susceptible to being affected by external factors⁽¹⁾. The Nursing diagnosis of insomnia is defined by NANDA-I⁽²⁾ as the “inability to initiate or maintain sleep, which impairs the normal performance of daily living functions”.

Quality of Life (QoL) can be affected in university students who have sleep disorders⁽³⁾. It is understood as an individual's personal perception of the context in which they are embedded⁽⁴⁾. Factors such as being in the first or last semester of the undergraduate course, increased academic workload, inadequate eating and sleeping habits, among others, have the potential to directly affect the students' quality of life. It should be noted that during the academic training period, preserving sleep quality and quality of life are fundamental conditions and reflect on the good psychic, social, work and mental state functioning of university students^(3,4).

There is evidence of negative impacts on QoL due to poor sleep quality in university students. A Brazilian study⁽⁴⁾ carried out with students in the health field demonstrated a high percentage of indications of depression and sleep disorders, in which the academics' perception of quality of life was declared poor by almost 40% of the participants. Thus, the importance of health actions aimed at improving sleep patterns and quality of life in this population is highlighted⁽⁵⁾.

From this perspective, non-pharmacological interventions are listed as a good option for complementary therapy in the treatment of insomnia and for improving the quality of life of individuals, since pharmacological therapies, such as the use of benzodiazepines, have

questionable long-term efficacy due to the potential risk of tolerance and dependence⁽⁶⁾. Integrative and Complementary Health Practices (PICS) aim to stimulate the body's natural mechanisms through comprehensive care for the prevention and recovery of health-disease processes, focusing on a broader view of the individual through empathetic listening and the creation of a bond⁽⁷⁾.

In Traditional Chinese Medicine (TCM), auriculotherapy stands out as one of the most important PICS. This is characterized by the use of specific points on the auricle to alleviate psychosomatic and physical dysfunctions. In this technique, the auricle is understood as a microsystem that presents reflex correspondences with other parts of the body through neural pathways in the central nervous system (CNS), these amplify vagal activity and improve the imbalance of the sympathetic and vagal systems⁽⁸⁾.

In a previous study⁽⁹⁾ with university students from a federal public university in Zona da Mata Mineira there was a 19.65% increase in the perception of quality of life after treatment with auriculotherapy. The implementation of auriculotherapy can contribute to the improvement in quality of life and sleep. Furthermore, the cost is low, mass treatment is possible, and side effects are minimal or absent⁽¹⁰⁾.

Qigong, on the other hand, is a traditional Chinese exercise that aims to integrate body and mind. Developed by the General Administration of Sport of China, it consists of eight main movements. One of its variants is *Baduanjin*, a low-energy exercise that improves physical fitness and simultaneously helps regulate mood, reducing blood pressure and relaxing the body. It is an important ally of Traditional Chinese Medicine (TCM) in the prevention and adjuvant treatment of physical and mental problems⁽¹¹⁾. Unlike resistance training, which usually focuses on the body, *Baduanjin Qigong* aims at the balance between body, mind and soul, thus impacting quality of life and emotions⁽¹²⁻¹³⁾.

The effect of auriculotherapy on sleep disorders and *Baduanjin Qigong* on physical and emotional aspects of university students has been researched and evidenced separately by previous studies⁽¹³⁻¹⁴⁾. Also, one study highlighted⁽¹⁵⁾ the lack of research related to the topic of *Baduanjin Qigong* in university students, especially when combined with other non-pharmacological methods, thus highlighting the need for further investigation.

The study of the association between auriculotherapy and *Baduanjin Qigong* is innovative and may enable the implementation of a therapeutic practice that enhances positive results in promoting the health of university students. It is also essential to assess the level of satisfaction with the techniques in order to verify the benefits and drawbacks caused by them,

to support the hypothesis that these techniques can improve the quality of sleep and life of this population.

Thus, the present study aimed to evaluate insomnia and quality of life before and after the application of auriculotherapy, associated with *Baduanjin Qigong*, and the satisfaction of university students with the intervention.

METHOD

This is a quantitative, quasi-experimental, single-group study in which the assessment is performed on a single group before and after the interventions, and is not randomized. This design is justified by the study's interest in evaluating changes over time in a single group, before and after the intervention, in order to verify its impact on the variables of interest.

The research was conducted on the main campus of a state public university in the north of the state of Minas Gerais, Brazil, from November 2023 to April 2024. In this study, researchers applied auriculotherapy and *Baduanjin Qigong* interventions and observed the effect of these techniques on the variables “insomnia” and “quality of life”. In addition, the satisfaction of university students with the interventions was subsequently verified. The Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) statement, which guides non-randomized studies, was used as a writing guide⁽¹⁶⁾.

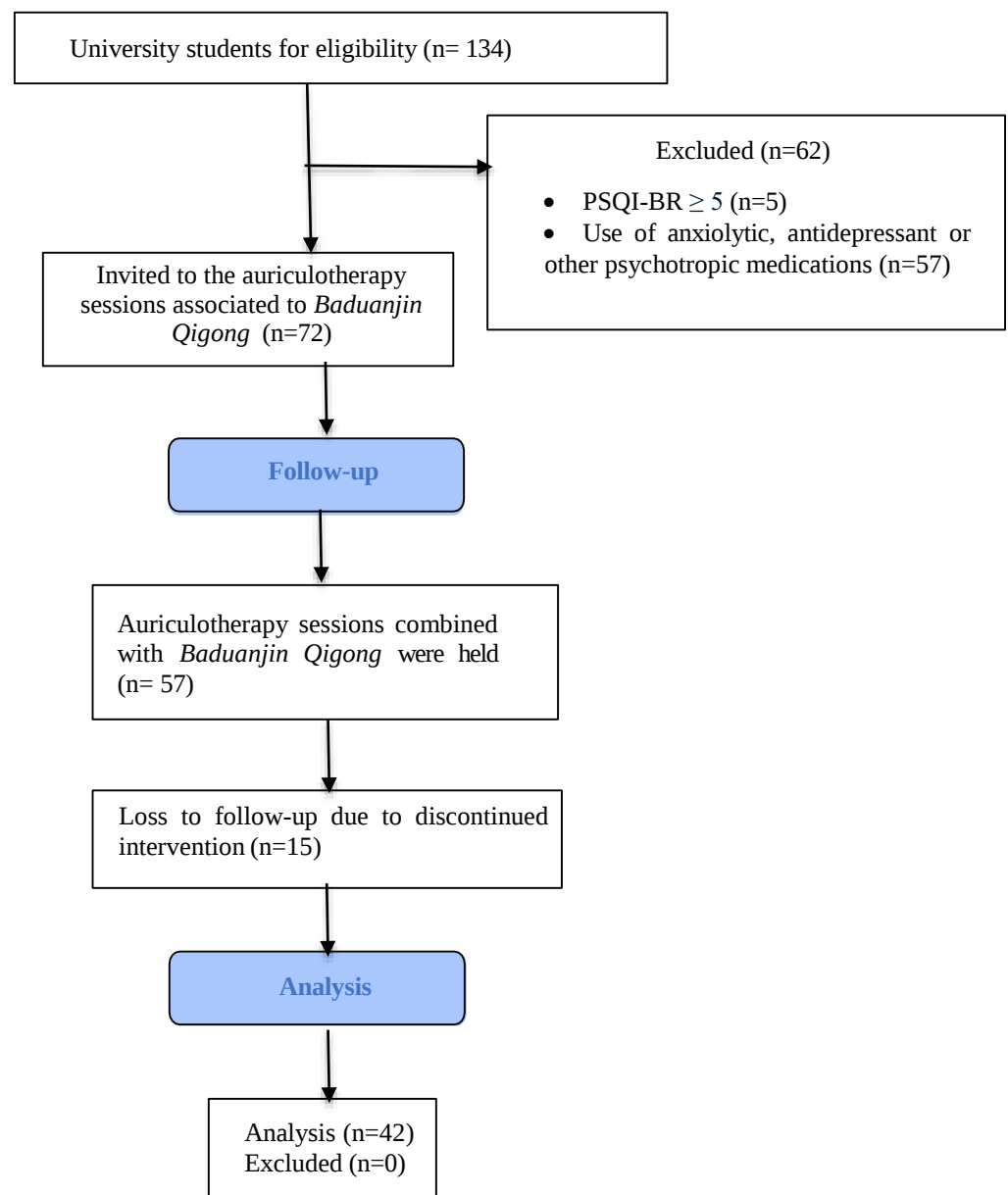
The inclusion criteria were university students aged 18 or older, with time available to answer the scales, the study instruments and to attend the treatment sessions, in addition to obtaining a score equal to or greater than five on the Pittsburgh Sleep Quality Index Questionnaire (PSQI-BR)⁽¹⁷⁾. The exclusion criteria were: use of benzodiazepine, antidepressant or anxiolytic medications; having an infection, inflammation, injury to the auricle or reporting an allergy to microporous tape; having a piercing at the point insertion site (except for normal earrings) and using a hearing aid. Furthermore, students who missed two consecutive sessions or exceeded the interval greater than ten days between them; who reported any type of intense discomfort at the crystal application site; those who chose not to continue treatment and those who did not adequately complete the instruments provided in the data collection were discontinued from the interventions.

The study population consisted of university students regularly enrolled in any of the courses at the institution where the research was conducted and who reported symptoms indicative of insomnia. For the sample composition for comparison of means, a margin of error of 0.05, a confidence level of 95%, and an effect size of 0.5 were considered, resulting

in a minimum sample of 40 participants. Convenience sample was used, considering the accessibility, availability, and interest of students in voluntarily participating in the research. Thus, the study included students who were interested in participating.

Among the study population, 134 responded to the research instruments. Of these, five did not achieve a score of five or higher on the PSQI-BR, and 57 were using anxiolytic, antidepressant, or other psychotropic medications. Therefore, 72 students met the inclusion criteria and were invited to participate in auriculotherapy sessions combined with *Baduanjin Qigong*. However, 57 students participated, but only 42 completed the intervention protocol (a 26.31% loss in total) (Figure 1). It should be noted that, to mitigate sample loss, the researchers sent weekly messages to participants to reinforce the benefits of the interventions and the importance of participating in the study until its completion.

Figure 1. Sample tracking flowchart. Montes Claros (MG), Brazil, 2023-2024.



Source: adapted from CONSORT (<http://www.consort-statement.org/consort-statement/flow-diagram>).

For the recruitment of university students, vacancies were advertised on social networks, WhatsApp® groups, and with flyers on the bulletin boards of the centers for each area of knowledge at the university. Thus, all participants who met the eligibility criteria to participate in the study signed the Informed Consent Form (ICF) and answered the sociodemographic and clinical characterization instruments, and were evaluated for insomnia and quality of life (initial assessment).

Subsequently, dates and times were scheduled, according to a previously established timetable, for the students to attend the Center for Biological and Health Sciences (CCBS) of the university for the application of *Baduanjin Qigong* auriculotherapy. It should be noted that due to logistical reasons for the team, the participants were assisted in groups, but always by the same research members in all sessions.

At the end of the treatment, the students were again evaluated for insomnia and quality of life (final assessment), as well as their satisfaction with the interventions applied.

Regarding the instrument for collecting clinical and sociodemographic information, this was adapted by the researchers from previous studies⁽³⁻⁹⁾, with the following variables: sex; age; marital status (with partner or without partner); course; academic semester; monthly income; skin color and comorbidities.

Insomnia, the primary variable in this study, was assessed using the PSQI-BR⁽¹⁷⁾. In addition, quality of life measured by the World Health Organization Quality of Life-Bref (WHOQOL-Bref)⁽¹⁸⁾ and clinical and sociodemographic characteristics were included as covariates.

The PSQI-BR⁽¹⁷⁾ consists of 19 questions, with scores ranging from zero to 21 points. The points are assigned in the following evaluative components were considered: C1 subjective sleep quality, C2 sleep latency, C3 sleep duration, C4 habitual sleep efficiency, C5 sleep disturbances, C6 use of sleep medication, and C7 daytime sleep dysfunction. The sleep quality of individuals can be classified as good (scores from 0 to 4), poor (scores from 5 to 10) and presence of sleep disorder (scores above 10). It is noteworthy that the assessment by the instrument considers the sleep habits of the previous month. In this study, the standardized score for the outcome was ≥ 5 points, since scores ≥ 5 points indicate poor sleep quality, and < 5 indicate good sleep quality⁽¹⁷⁾.

The secondary variable, defined as quality of life, was assessed using the WHOQOL-Bref⁽¹⁸⁾. The instrument has 26 questions, which assess the individual's physical and mental health through 24 questions encompassing the physical, social, psychological and environmental domains, in addition to two questions about the perception of quality of life and satisfaction with health. Thus, each question is validated by a Likert scale from 1 to 5, where the closer the final value is to zero, the more unfavorable the quality of life, and the closer to 100, the more favorable the quality of life⁽¹⁹⁾.

Auriculotherapy was performed with radionic crystals, in four sessions, once a week, alternating ears in each session, totaling one month of treatment. The auricular points selected

for application were Shenmen (TF₄), Kidney (CO₁₀), Sympathetic, Liver (CO₁₂), Spleen (CO₁₃), Heart (CO₁₅), Subcortex (AT₄), Neurasthenia and Adrenal (TG₁)⁽¹⁹⁻²²⁾. For the correct identification of the points, inspection and palpation were performed, in addition to the location being aided by the point map of the World Federation Of Acupuncture Moxibustion Societies⁽²³⁾.

Prior to performing the auriculotherapy, the auricle was disinfected with cotton and 70% ethyl alcohol. Subsequently, microporous tape was used to adhere the crystals to the auricle while the participant was seated. Furthermore, the university students were instructed not to apply manual pressure to the application sites, nor to attempt to reposition the point if it was not in its exact location. This instruction is justified by the fact that the objective of the study was exclusively to evaluate the effect of passive auricular stimulation by the crystals, since any manual stimulation introduced by the participants could constitute an uncontrolled variation of the treatment, risking bias in the results and hindering the interpretation of the real effects of the proposed intervention. Finally, the technique was applied by a team of researchers who had training and experience in the application of auriculotherapy.

Following each application of auriculotherapy, *Baduanjin Qigong* was guided by a professional trained in performing the exercises. The practice of *Baduanjin Qigong* involved performing eight movements, which are: looking at the heels; supporting the sky with the hands; raising an arm or separating heaven and earth; stretching the bow and releasing the arrow; lifting the heels seven times; shaking the head and coccyx; stretching the hands into fists with a firm gaze and holding the tips of the toes⁽¹³⁾.

For the exercises, the students were initially positioned standing, with enough space to perform the technique without interfering with each other's execution. Next, the *Baduanjin Qigong* instructor guided them through the movements, accompanied by controlled breathing under supervision and with ambient music playing for the students' comfort. They were instructed to breathe diaphragmatically and repeat the exercises as instructed. The exercise time was 15 minutes.

Finally, after the interventions, participants were asked to rate their level of satisfaction with the therapeutic techniques applied using an instrument adapted from a previous study⁽⁹⁾. To this end, they indicated, on a Likert scale of 1 to 5, the degree of satisfaction with the interventions (“extremely dissatisfied”; “dissatisfied”; “not sure”; “satisfied”; “extremely satisfied”) ; the need for the interventions (“totally unnecessary”; “unnecessary”; “not sure”; “necessary”; “totally necessary”) and the general state of health

after the completion of the interventions (“much better”; “better”; “no change”; “worse”; “much worse”).

Data analysis was performed using the Statistical Package for Social Science (SPSS®) software, version 24.0. For continuous variables, descriptive statistics were used, employing simple and percentage frequencies, described by the mean, standard deviation, and minimum and maximum values. Furthermore, absolute and relative frequencies were used to describe categorical variables. To verify the distribution of the collected data, the Shapiro-Wilk test was applied, which showed a normal distribution of the scalar variables. In the analysis of the intervention's effect on insomnia and quality of life, the paired *t*- test was used, with a significance level of 5%.

This study complies with Resolution 466/2012 and was approved by the Ethics and Research Committee (CEP) of the State University of Montes Claros (UNIMONTES), under Protocol no CAAE 73849723.60000.5146.

RESULTS

Of the 42 students who participated in the study, most were female (83.30%), with an average age of 22.80 years (SD=4.01 years), single (92.80%), enrolled in the Nursing course (69.00%), in the 7th to 9th semester of their undergraduate studies (50.00%), without a fixed monthly income (64.30%), and of brown skin color (45.20%), with depression as the main illness (16.70%) (Table 1).

Table 1 – Sociodemographic and clinical characteristics of university students (n=42). Montes Claros (MG), Brazil, 2024.

Variables	(n*) %†
Sex	
Female	35 (83.30)
Male	7 (16.70)
Age (M±SD)	22.80 ± 4.01
Marital status	
Without a partner	39 (92.80)
With a partner	3 (7.20)
Course	
Nursing	29 (69.00)
Dentistry	2 (4.80)
Physical education	2 (4.80)
Economic Sciences	1 (2.40)
Law	1 (2.40)
History	1 (2.40)

Social Sciences	2 (4.80)
Civil Engineering	2 (4.80)
Master's degree	1 (2.40)
Semester of the course	
1 st to 3 rd	14 (33.30)
4 th to 6 th	6 (14.30)
7 th to 9 th	21 (50.00)
10 th to 12 th	1 (2.40)
Monthly income	
No fixed income	27 (64.30)
1 minimum wage	13 (31.00)
2 to 3 minimum wages	2 (4.80)
Skin color	
Brown	29 (45.20)
White	15 (35.70)
Black	8 (19.00)
Chronic disease ‡	
Depression	7 (16.70)
Heart diseases	1 (2.40)
Others	2 (4.80)

n † – Absolute frequency; %* – Relative frequency; M = Mean; SD = Standard deviation; ‡The participant could select more than one answer option.

The PSQI had an initial average score among participants of 9.57 ± 3.14 points. After the intervention, the statistically significant final average was 5.66 ± 2.80 points ($P < 0.001$). A statistically significant improvement was also observed in the domains of perceived quality of life, satisfaction with physical and psychological health, the WHOQOL-Bref, and quality of life after treatment with auriculotherapy associated with *Baduanjin Qigong* (Table 2).

Table 2 - Insomnia and quality of life domains before and after auriculotherapy combined with *Baduanjin Qigong* (N=42). Montes Claros (MG), Brazil, 2024.

PSQI-BR and Domains	Pre-intervention (Initial assessment)				Post-intervention (Final evaluation)				Value - P
	Average	(SD*)	Min.‡	Max.§	Average	(SD*)	Min.‡	Max.§	
PSQI-BR	9.57	(3.14)	5.00	17.00	5.66	(2.80)	1.00	12.00	<0.001
Perception of Quality of Life	58.92	(50.52)	0	100	68.45	(19,17)	25	100	0.037
Satisfaction with Health	42.85	(18.54)	25	75	60.11	(20.70)	0	100	<0.001
Physical	52.12	(12.11)	25	89.29	66.49	(13.26)	32.14	100	<0.001
Psychological	49.30	(14.19)	25	91.67	54.36	(10.20)	37.5	83.33	0.021

Social	60.31	(18.57)	25	100	67.45	(16.13)	33.33	100	0.055
Environmental	55.13	(13.67)	18.75	87.5	56.47	(13.46)	21.88	87.5	0.589

*SD – Standard deviation; Min.‡ - Minimum value; Max.§ - Maximum value; II Paired-samples *t*- test

Regarding satisfaction with the interventions, the majority of students were satisfied with the interventions (42.90%), considered the need for the interventions as totally necessary (45.20%), and considered their state of health, after completing the interventions, as improved (52.40%) (Table 3).

Table 3 – Satisfaction with auriculotherapy intervention associated with *Baduanjin Qigong* (N=42). Montes Claros (MG), Brazil, 2024.

Variables	(n*) %†
Satisfaction with the interventions	
Extremely dissatisfied	2 (4.80)
Dissatisfied	0 (0.00)
I am not sure	6 (14.30)
Satisfied	18 (42.90)
Extremely satisfied	16 (38.10)
Perception of the need for interventions	
Completely unnecessary	0 (0.00)
Unnecessary	0 (0.00)
I am not sure	5 (11.90)
Necessary	18 (42.90)
Absolutely necessary	19 (45.20)
Perception of overall health status after completion of interventions	
Much better	16 (38.10)
Better	22 (52.40)
No change	4 (9.50)
Worse	0 (0.00)
Much worse	0 (0.00)

n† – Absolute frequency; %* – Relative frequency.

DISCUSSION

University students are exposed to internal and external risk factors that can negatively influence and impact their sleep and quality of life⁽³⁾. The association between auriculotherapy and *Baduanjin Qigong* has shown a positive effect in minimizing insomnia and providing a better perception of the quality of life of the participants, thus highlighting the importance of implementing interventions for this population.

A reduction of 3.91 ($p < 0.001$) was observed in the final mean insomnia score. Some previous studies^(9,19) have shown beneficial effects of auriculotherapy for improving sleep quality and quality of life in university students. Regarding the effect of *Baduanjin Qigong* on

sleep, studies demonstrate a positive result in the general adult population, without considering the university setting and quality of life⁽²⁰⁻²⁴⁾. Thus, this research proves to be innovative and relevant by obtaining favorable results on insomnia and quality of life, specifically in university students.

Regarding the perception of quality of life domain of the WHOQOL-Bref, there was a significant increase of 9.53%, suggesting the potential positive effect of auriculotherapy and *Baduanjin Qigong* in increasing this perception, resulting from the beneficial effects on sleep and quality of life of the students who comprised the sample of this study. In a study that used auriculotherapy and sought to evaluate the quality of life of academics in the pandemic context, the perception of quality of life reached 22.02%⁽⁹⁾. This interpretation may be impacted by the current context in which the student lives and reflects a subjective harmony of aspects related to health and well-being⁽⁴⁾. Therefore, the understanding of quality of life can be influenced by daily habits that affect the emotional well-being and sleep patterns of students.

Among the students participating in the research, complaints regarding changes in aspects related to quality of life, as assessed by the WHOQOL-Bref, were highest in the health satisfaction domain. After the interventions, resulting from the combination of auriculotherapy and *Baduanjin Qigong*, there was a 17.26% increase. A further 14.37% increase was evident in the physical and other domains. 5.06% in the psychological domain, which demonstrates a better ability to adhere to healthy habits. Some studies have already reported the positive impact that auriculotherapy and *Baduanjin Qigong* have on improving signs and symptoms related to aspects of satisfaction with health, both psychological and physical^(8-10,13). However, these studies do not consider the association of these practices for the treatment of insomnia and the improvement of quality of life in university students.

Furthermore, a 7.14% increase was also observed in the social domain. This study highlights the relevance of the methods implemented to strengthen social relationships and points out that quality of life can be impacted by the fragility in these interactions and emotional disorders, which foster a state of persistent insomnia. Therefore, despite the different contexts, social relationships are capable of promoting health, through the provision of emotional support for the improvement of quality of life, health promotion and adaptation to critical contexts of human experience⁽²⁵⁾.

With regard to the environmental domain, this was the only one that did not show a significant difference before and after the intervention. However, some similar studies have shown that this domain can be influenced by collective and societal changes over time^(9,26).

The auriculotherapy protocol adopted in this study was based on three randomized clinical trials that used the auricular points *Shenmen*, Kidney, Sympathetic, Liver, Spleen, Heart, Subcortex, Neurasthenia and Adrenal, for the control of insomnia^(14,20-21).

In a study conducted on the perception of Primary Health Care workers with the use of auriculotherapy, one reported effect was the improvement in sleep quality and quality of life⁽¹⁰⁾.

The adoption of the *Baduanjin Qigong* protocol was based on a randomized controlled study, which integrated the ancient practice of an exercise practiced in Chinese martial arts sports with scientific literature⁽¹³⁾. In the research⁽¹³⁾, carried out with university students, there was an improvement in body shape (weight and body mass index), cardiovascular and respiratory pulmonary function, flexibility, balance capacity, muscle strength and mental health of female university students. In another study, which evaluated the quality of sleep and life of a specific group, the overall quality of life increased significantly, by 12.39 ($P < 0.001$), in the *Baduanjin* exercise group, compared to the control group; the overall PSQI score also decreased by 4.85 ($P < 0.001$) in the *Baduanjin* exercise group, while it increased by 0.34 in the control group⁽²⁷⁾.

Regarding the satisfaction of university students with the interventions performed, the majority considered themselves satisfied (42.9%), followed by those who were extremely satisfied (38.1%). Furthermore, most students (45.2%) considered the applied techniques totally necessary, and 52.4% mentioned that their general condition after completing the treatment sessions was "better". The findings agree with a study that showed the high level of student satisfaction with TCM techniques⁽⁹⁾. None of the participants presented any serious adverse reactions to the applied methodologies. The most frequently reported discomforts were local irritation, for auriculotherapy, and dizziness, for *Baduanjin Qigong*; however, these were considered ephemeral and bearable states, which demonstrated the safety of the approaches performed^(9,11).

In this context, it is worth highlighting This research presents itself as an innovative scientific investigation, since it was not possible to find, in the literature reviewed, work that promotes two consolidated TCM practices used together for the benefits of reducing insomnia and improving the quality of life in university students. Previous studies have already shown the benefits of auriculotherapy and *Baduanjin Qigong* used separately and in different contexts^(8,9,11,13), both safe and low-cost practices^(9,28-29). Furthermore, it highlights the opening of a vast investigative field for the advancement of health sciences, through its practical impact on the daily lives of health professionals and patients.

This study had limitations, such as the size of the composite sample, since the number of students in a public university is significantly larger compared to the sample size. However, the verification of a homogeneous sample through the application of statistical normality tests made the procedure amenable to concrete scientific production. It is also worth noting the composition of a convenience sample, which may compromise the generalizability of the results to other populations. Despite this, the sample reflects the reality of the studied context and allows us to understand the practical applicability of the intervention in a specific scenario.

It is noteworthy that, due to logistical issues for the team, participants were attended to in groups, which may have contributed to participant attrition. Sample losses occurred mainly due to voluntary withdrawal, scheduling conflicts for participation in data collection phases, and difficulty maintaining engagement throughout the four-session follow-up period. However, to mitigate these impacts, several management strategies were adopted to maintain and ensure effective participant participation, in addition to frequent electronic contact, which reinforced the importance of continuity in the study.

Uncontrollable external factors represent a limitation, since the participants were immersed in different environmental realities outside the university, a fact that may highlight the results obtained in the environmental domain of the WHOQOL-Bref. Despite this, the possibility of providing the same conditions for the participants during the sessions was a minimizing factor in such discrepancies. However, the method applied in this study made it possible to achieve satisfactory results with scientific robustness.

Finally, the absence of blinding for researchers and/or participants may have introduced observational or expectational biases. Nevertheless, standardized measures and objective evaluation criteria were used to mitigate these effects and increase the reliability of the findings.

Despite its limitations, the study demonstrated that the association between auriculotherapy and *Baduanjin Qigong* represents an innovative integrative approach. This is an original quasi-experimental study that explores the potential of these two low-cost, easy-to-apply interventions, which have a favorable safety profile and are functional in vulnerable clinical populations. By investigating the combined intervention – rather than each technique in isolation – the study offers theoretical novelty and practical applicability. These elements strengthen the scientific contribution to the literature on complementary therapies and to evidence-based clinical practice.

In this context, provided it is carried out by qualified professionals, Nursing and the other professional categories addressed in the research can use these tools as intervention instruments to improve the quality of care for university students, as well as other specific populations.

CONCLUSION

This study demonstrated an increase in sleep quality, as well as in the domains of perceived quality of life, satisfaction with health, physical well-being, psychological well-being, and social relationships after auriculotherapy intervention, associated with *Baduanjin Qigong*, in university students. Furthermore, the students felt satisfied with the treatments received, believed the interventions were entirely necessary, and reported an improved overall state of health after the research was completed.

These results demonstrate that the combination of the two interventions is capable of promoting health and well-being among the student population, improving sleep quality and quality of life for these students, resulting in positive impacts on their physical and mental health, thus facilitating coping with the adversities that permeate the undergraduate period. Finally, further investigations with a controlled and randomized design are recommended in other contexts and with complementary integrative practices, to confirm the initial findings, clarify the mechanisms and promote a safe and evidenced-based clinical practice for health promotion.

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Availability of data and material

Access to the dataset may be obtained by requesting it from the corresponding author.

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