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Original Article

Anxiolytic Effect of Acupuncture Treatment for Anxiety Compared with Phytotherapy: A Randomized Clinical Trial in Brazil

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ABSTRACT

Background: Anxiety is the most common psychological disturbance; therefore, safe, and effective therapeutic options are necessary for managing the associated symptoms. The aim of this study was to assess the anxiolytic effect of acupuncture, and phytotherapeutic *Valerian officinalis* in anxious patients.
Methods: The trial was a participant- and assessor-blinded, parallel clinical study with 64 anxious patients who were randomized into 4 study groups. All patients, upon attendance at the clinic, were asked to lie down and perform abdominal breathing. In total, the volunteers in Real Acupuncture Group received 5 sessions of acupuncture while those of the Placebo Acupuncture Group received no intervention. In total, the volunteers in Real Phytotherapy Group received 28 capsules of V. officinalis and the Placebo Phytotherapy Group, 28 inert capsules. Anxiety was measured using the Visual Analogue Scale and State-Trait Anxiety Inventory, and Ryodoraku and Bioelectrography were used for energy analysis.
Results: After 5 weeks, analysis of the Visual Analogue Scale scores, all groups achieved a statistically significant reduction in levels of anxiety and the Real Acupuncture showed a large effect. All groups showed a reduction in the State-Trait Anxiety Inventory score, with the sub-item, "State in Real Acupuncture" being important. Ryodoraku showed the electrical properties values of the skin and with Bioelectrography indicated generally low energy that decreased further following use of the therapies.
Conclusion: Acupuncture was effective in reducing patients' anxiety and had a larger effect size than V. officinalis, therefore it could be offered as an alternative treatment for anxiety management.

Keywords: acupuncture, anxiety, integrative medicine, phytotherapy

Introduction

Anxiety is an emotional disorder that has increased significantly in recent times and affects people of all ages and socio-demographic profiles [1]. Worsened by the COVID-19 pandemic, anxiety is considered a global public health problem capable of affecting patients' routines, which may compromise their social, and personal relationships [1]. The most recurrent symptoms of anxiety are tension, tachycardia, nervousness, and the inability to relax. If these symptoms are not treated, the individual may become predisposed to factors for other diseases such as depression, or even premature death [1,2].

The conventional therapeutic protocol is performed with the use of prescribed drugs that reduce the symptoms associated with anxiety, however, chronic habitual use leads to many undesirable side effects [3]. For this reason, accessible, nonpharmacological therapeutic options are increasing being sought [4].

One third of North American adults have used some type of Integrative and Complementary therapy to maintain or control a health condition [5]. Integrative health therapies are becoming far more accessible. In addition, due to the National Policy on Integrative and Complementary Practices in the Brazilian Unified Health System [6], any citizen can be treated with these therapies. Knowledge about the safety and effectiveness of these therapies is essential to enable informed choice of treatment. Many integrative therapies

can be used to treat anxiety such as aromatherapy, music therapy, acupuncture, and phytotherapy [7-10].

Acupuncture became popular in the West in the mid-1970s, and since then, many clinical studies have been conducted and have shown the effectiveness of acupuncture in reducing preoperative anxiety [11], abstinence from drug abuse [12], and during/following treatment of cancer [13]. However, there is a scarcity of literature comparing acupuncture with other integrative practices used for reducing anxiety.

Due to the high prevalence of anxiety in the population, the aim of this pilot randomized clinical trial was to assess and compare the effect of acupuncture with phytotherapy in the management of anxiety symptoms. In addition, this study investigated the energy profile of anxious patients by measuring the electrical property in skin using the Ryodoraku technique and the Bioelectrography technique where high voltage electricity is applied and the energy cascade discharge is caught as an image.

Materials and Methods

A randomized, participant- and assessor-blinded parallel clinical trial was conducted in accordance with the Consolidated Standards of Reporting Trials [14] and STandards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA) [15]. It was approved by the Research Ethics Committee of the Piracicaba School of Dentistry FOP/Unicamp (no.: 12797119.9.0000.5418) and registered in the Brazilian Registry of Clinical Trials (code no.: RBR-72qkvy). All participants read and signed the Informed Consent Form.

1. Participants

The participants were from the general community who sought treatment for anxiety-related symptoms from the FOP/Unicamp Acupuncture Clinic or the Primary Care Reference Center in Piracicaba/São Paulo, Brazil or the Dental Specialty Center of Piracicaba.

To be included in the study volunteers had to be over 18 years of age, with self-reported anxiety and a visual analogue scale (VAS) score for anxiety ≥ 4. Volunteers were not excluded from the study according to sex or gender. However, individuals who were receiving medication for anxiety, were pregnant, or were patients with compressed nails and fingerprints that were difficult to read by Bioelectrography they were excluded from the study.

2. Interventions

The research consisted of 4 study groups who were monitored (acupuncturist/pharmacist) and assessed weekly for 5 weeks: (1) Real Acupuncture Group: volunteers received 5 acupuncture sessions (once a week for 5 weeks) to control anxiety using acupoints CV17 (Shanzhong), PC6 (Neiguan) and LU9 (Taiyuan), with needles inserted unilaterally with manual stimulation, according to Traditional Chinese Medicine. Acupuncture was performed with the use of disposable stainless-steel needles measuring 30 × 0.25 mm (Wujiang City Shenli Medical & Health Material Co. Ltd, China). Asepsis of the needle insertion site was performed using 70% alcohol. The procedure was performed by a licensed, experienced acupuncturist (E.C.A.), hired solely for this role and without involvement in other stages of the research. The needles were kept in place for 20 minutes, removed, and discarded in an appropriate container. (2) Control Acupuncture Group: volunteers were instructed to lie down on the treatment table (or examination bed) and perform abdominal breathing, without receiving any therapeutic intervention. (3) Real Phytotherapy Group: volunteers received 28 capsules of Valeriana officinalis at a dosage of 600 mg per day (Florien Fitoativos Ltda - dry extract with 0.021% valerenic acid/internal batch 19F11-FL00-000002), to be taken throughout the entire treatment. The patient was instructed to ingest 1 capsule approximately 1 hour before going to sleep for 28 consecutive days [16]. (4) Control Phytotherapy Group: volunteers received 28 capsules of inert excipient (without active principle), organoleptically identical to the capsules used in the Real Phytotherapy Group, and were provided with the same instructions for use. The phytotherapy groups received their capsules from a specialized compounding pharmacy.

All the volunteers, in all groups, were instructed to perform abdominal breathing, as in the Placebo Acupuncture Group, throughout the time interval they remained in the place where the research was being performed.

At the end of the 5-week period, patients, belonging to both the treatment groups and the control groups, who were not satisfied with their intervention results could opt to receive either of the real treatments (acupuncture or phytotherapy).

3. Measures

3.1. VAS for anxiety

The measurement of patient-reported anxiety was performed using the VAS, an instrument used in clinical studies used to record the intensity of symptoms [17], such as anxiety [18]. In this study, the self-reported VAS score was used to evaluate the level of anxiety. The volunteer was asked to consider the following question: "Right now, how do you rate your anxiety, with 0 being no anxiety and 10 being maximum anxiety?" VAS scores were collected before and after each session in all the groups. The measurement of anxiety using the VAS scores were used as the primary outcome in this study. The recording of the VAS score, at the beginning and end of all sessions, was exploratory in

nature, and was used as a parameter to control the actions of the interventions during the 1-week interval between the 5 treatments.

3.2. Questionnaire for anxiety

A tool denominated the State-Trait Anxiety Inventory (STAI) was also used to assess anxiety. This consists of a self-perception scale that divided the assessment of anxiety into 2 types, trait-anxiety (T-Anxiety) and state-anxiety (S-Anxiety) [19]. T-Anxiety is attributed to a state of persistent and lasting anxiety, which may be associated with the individuals' personality and not just with a specific situation. Whereas S-Anxiety refers to a condition of temporary anxiety, usually related to a specific situation or stage of life in which the individuals find themselves. Meta-analysis was performed using the scores as comparative parameters between groups that received acupuncture for anxiety and those that did not [20]. In this study [20], the STAI was applied before and after the interventions in all the groups.

3.3. Ryodoraku

The Ryodoraku technique has been widely used in acupuncture research [21,22]. It consists of measuring the individual's circulating energy in 12 acupoints by means of the Ryodoraku device (RDK/NKL- Produtos Eletrônicos Ltda., Brazil) [23]. In the present study, the general energy was measured, in all groups, before and after the intervention. The Ryodoraku appliance measurement was recorded on the micro ampere (μA) scale.

3.4. Bioelectrography

For the capture and analysis of bioelectrographic data of the participants, a device that produced an electromagnetic field was used (Bio-Well Bioelectrography device, version 5.9.1.3; People's Republic of China). This device can stimulate the permeable electrons in the most superficial layers of the human finger, causing a stimulus that is captured as light by the camera attached to the device, and the image is in the form of a halo which can be measured by the software. The variations in permeability across the entire finger surface are detectable by the camera attached to the device [24]. The procedure was performed in triplicate, on all fingers (Complete Examination) of the patient's hand, and data were captured before and after all sessions in all groups. For this study, data on general energy and stress level were used for analysis.

4. Sample size

For the sample calculation, the estimates, obtained for the VAS tool to measure the anxiety response in a pilot study, by the software G*Power 3.1.9.2 (Universitat Dusseldorf, Germany) were considered.

As input determinants, we considered the effect size η^2 = 0.19 partial, obtained by the statistical test of analysis of variance (ANOVA) of repeated measures with interactions between group and time, for the variable VAS score at the level of power 1-β = 0.95 level of significance α = 0.05, which provided the minimum sample size of 16 participants in each of the groups, providing a mean effect size f = 0.48.

5. Randomization and blinding

For the purpose of double blinding, the groups were identified by letters (A through to D), so that neither the volunteer nor the researcher (in the case of the herbal medicine groups) knew which group they belonged to. The allocation sequence was generated manually by the research team using an alphanumeric list (i.e., without the use of statistical software or stratification). A researcher, not involved in participant recruitment or assessment, prepared the opaque, sealed envelopes containing each group assignment. All envelopes were then thoroughly mixed inside a closed box. At the start of the study, each participant randomly selected 1 envelope from the box (which was opened on the 1st day of the trial) to determine group allocation.

The capsules used in the phytotherapy groups were numbered at the compounding pharmacy, making it impossible to identify them during the study. Confidentiality was maintained by a researcher who was not present during collection, and only at the time of statistical analysis were the capsules identified in the reveal.

This was a randomized, participant- and assessor-blinded clinical trial. The acupuncturist administering the treatment knew whether the needles were inserted, and thus was not a double-blind trial.

6. Statistical analysis

The anxiolytic effects of acupuncture and herbal medicine were assessed by the outcome of analyses of the VAS scores, STAI scores, and Ryodoraku and Bioelectrography data. The Ryodoraku and bioelectrography assessments were included as exploratory measures to descriptively explore potential energetic patterns, rather than to provide validated physiological correlates of anxiety.

To test possible differences within and between groups, ANOVA for repeated measures was used. The main effects and those of interactions were analyzed with adjustment of the confidence interval by Bonferroni. The magnitude of the effects (d') was estimated, based on the estimates of the ANOVA eta-squared statistics parameter(η^2); with subsequent classification of its strength according to the Cohen convention, effects of approximately 0.20 were considered small, 0.50 medium, and high 0.80. A Repeated Measures Analysis of Variance with a General Linear Model

was performed for 4 groups, and included Mauchly's test of sphericity, and the Greenhouse-Geisser correction. The analysis was performed using a between-subjects design (group factor) and repeated measures over time (within-subject factor), using 5 measurement points over time (e.g., times 1, 2, 3, 4, and 5 at pre- and post-session time points in 5 sessions). The level of significance adopted for the analyses was 5% ($\alpha = 0.05$). The analyses were processed using the Statistical Package for the Social Sciences - SPSS (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY).

Results

Initial analysis resulted in 64 individuals who were eligible to participate in the study. The volunteers were randomly assigned to 1 of the 4 ($n = 16$) groups, and based on age, sex, anxiety, and energy, the groups were not significantly different (Table 1; Figure 1).

Analysis of VAS scores demonstrated that all the groups showed a statistically significant reduction in anxiety after 5 weeks of interventions (Table 2). At the beginning of the

Table 1. Participant Characteristics, Anxiety Scores, and Energy Levels

Characteristics	Real Acupuncture Group ($n = 16$)	Real Phytotherapy Group ($n = 16$)	Placebo Phytotherapy Group ($n = 16$)	Placebo Acupuncture Group ($n = 16$)	p
Age*	32.00	29.06	35.76	36.19	0.287
Sex‡ n (%)					0.142
Female	10 (62.5)	11 (68.7)	15 (93.7)	12 (75)	
Male	6 (37.5)	5 (31.3)	1 (6.3)	4 (25)	
STAI initial*					
S-anxiety	51.61	53.31	53.18	48.06	< 0.971
T-anxiety	50.22	50.81	52.41	49.87	1.000
VAS initial*	6.07	6.83	7.23	6.08	< 0.140
Ryodoraku initial*	24.56	25.00	23.06	21.56	1.000
Bioelectrography*	50.86	50.85	51.46	53.97	< 0.174

* ANOVA test. ‡ Proportion test.
STAI = state-trait anxiety inventory; VAS = visual analogue scale.

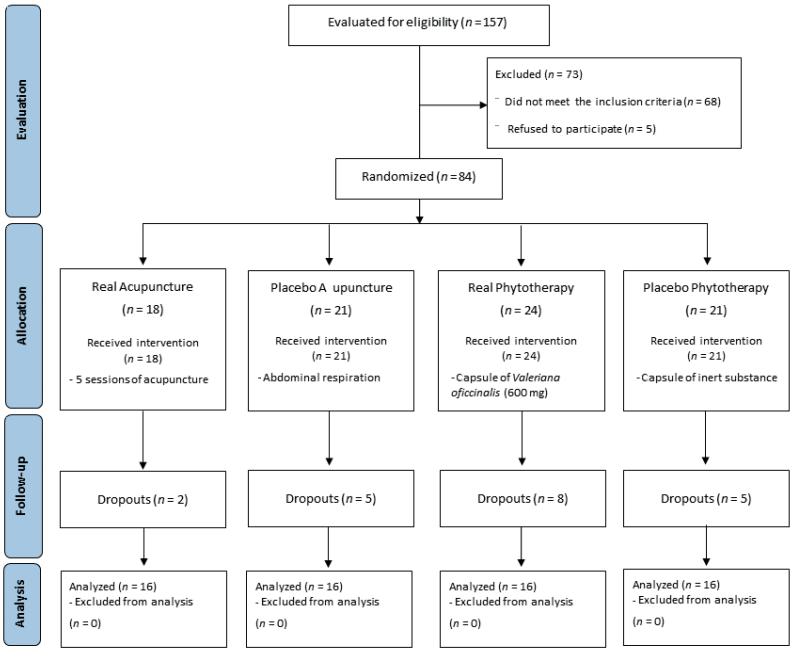

Figure 1. Flow diagram of the study.

Table 2. Mean VAS Values for Anxiety and Standard Deviation Before and After the Interventions Per Study Group (Piracicaba/SP)

Group	Before	After	*p*	CI (95%)
Real acupuncture	6.07* ± 1.66	1.74‡ ± 1.50	< 0.0001	3.39-5.26
Real phytotherapy	6.83* ± 1.46	2.69‡,§ ± 1.89	< 0.0001	3.15-5.13
Placebo phytotherapy	7.23* ± 1.23	3.82§,‖ ± 2.33	< 0.0001	2.45-4.37
Placebo acupuncture	6.08* ± 1.55	5.02‖ ± 1.40	0.037	0.07-2.05

Different symbols (*, ‡) in horizontal (line) indicated statistically significant difference within the Group / *t* test.
Different symbols (§,‖) in vertical (column) indicated a statistically significant difference between Groups / ANOVA.
CI(95%) = confidence interval / VAS: Visual Analogue Scale .

Table 3. Comparison of Initial VAS of Anxiety in Each Session with the Initial VAS of Anxiety in the 1st Session within Each Study Group (Piracicaba/SP)

Session	Real Acupuncture Group		Placebo Acupuncture Group		Real Phytotherapy Group		Placebo Phytotherapy Group	
	X	*p*	*X*	*p*	*X*	*p*	*X*	*p*
1	6.07	-	6.08	-	6.83	-	7.23	-
2	5.19	0.914	6.08	1.000	5.23	0.043	5.88	0.117
3	3.57	< 0.001	5.55	1.000	3.95	< 0.001	5.69	0.044
4	3.86	0.001	5.92	1.000	4.68	0.003	5.52	0.025
5	3.66	< 0.001	5.24	1.000	4.32	< 0.001	4.64	< 0.001

X = mean /*t* test.
VAS = visual analogue scale.

interventions there was no significant difference among the groups in the levels of anxiety measured using the VAS ($p > 0.140$; Table 2). The Real Acupuncture and Real Phytotherapy Groups showed reduced anxiety in an equal manner ($p < 0.0001$). Comparative analysis of the initial VAS score at the 1st session, with consecutive sessions, showed that the volunteers began the sessions with a lower degree of anxiety than they had in the previous session demonstrating a cumulative effect. This could be observed in all the groups, except for Placebo Acupuncture Group ($p = 1.000$; Table 3).

When the initial VAS score at the 1st session was compared with the initial VAS score at the 5th session, there was a drop of 39.70% in the Real Acupuncture Group, 13.82% in the Placebo Acupuncture Group, 36.75% in the Real Phytotherapy Group, and 35.82% in the Placebo Phytotherapy Group.

The effect size of the therapies, in the reduction of anxiety, measured by the VAS scores, from session to session, in all the groups, can be visualized in Figure 2. Only the Real Acupuncture Group was observed to have a large effect (red) size. That is, there was a great change between the 1st and 2nd session, effectively reducing anxiety, and the anxiety continued to diminish moderately from the 3rd session onwards, which did not occur in the Real Phytotherapy Group or in the Placebo Groups.

All the volunteers began the study, classified by the STAI tool, as being anxious, relative to both Trait and State. The analysis of the S-Anxiety and T-Anxiety mean values showed a statistically significant reduction in all the study groups ($p < 0.05$), except for Placebo Acupuncture Group in the sub-item T-Anxiety ($p = 0.57$; Table 4). All groups showed a reduction in this variable, and the decrease was more evident in the Real Acupuncture Group.

The energy analysis according to the Ryodoraku theory showed that all groups began the study with general energy deficiency (below 40 µA) and after the interventions there continued to be a reduction in energy (Table 5).

A comparison of the mean values differences in general energy, using the Bioelectrography technique, between groups at the end of each session, demonstrated that the Acupuncture Groups ended their 1st and 2nd session in different ways. The Placebo Acupuncture Group had more energy than the Acupuncture Group. Whereas a comparison of the mean value differences in stress, at the end of the sessions, demonstrated that at the end of the 4th and 5th session, the Real Acupuncture Group and Placebo Phytotherapy Group statistically different ($p = 0.014$ and $p = 0.010$, respectively). This showed that the stress of Placebo Phytotherapy Group did not diminish to the same extent as that of Real Acupuncture Group.

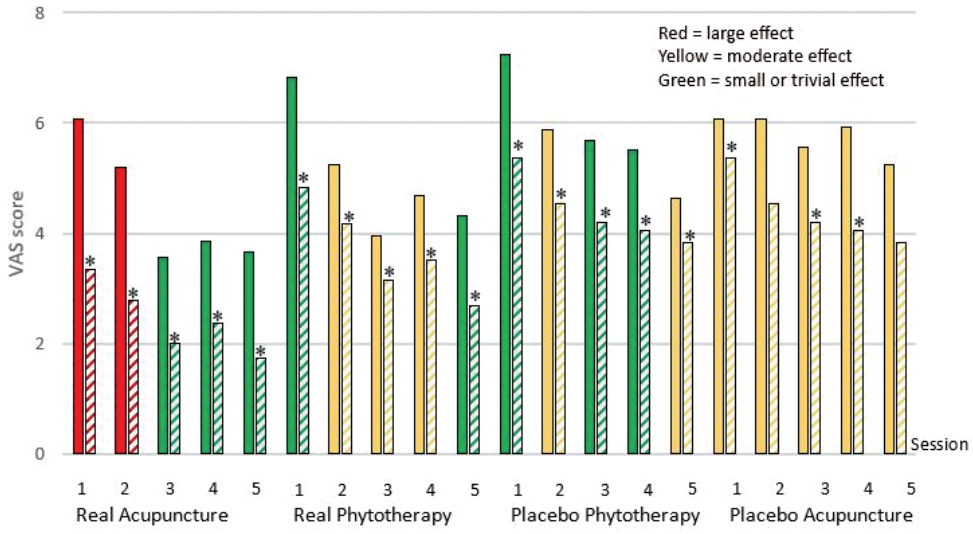

Figure 2. Effect of the interventions on reducing anxiety in the study groups according to the initial and final VAS score for each session.
*$p < 0.05$.
The solid color refers to before and the hatched refers to after each session.
Green = small or trivial effect; Red = large effect; Yellow = moderate effect.

Table 4. Mean of Differences Between Before and After Interventions of STAI S-Anxiety and T-Anxiety According to Study Group (Piracicaba/SP)

Group	S-Anxiety *X*	*p*	CI (95%)	T- Anxiety *X*	*p*	CI (95%)
Real acupuncture	15.28	< 0.0001	10.55-20.00	10.72	< 0.0001	6.78-14.66
Real phytotherapy	10.69	< 0.0001	5.67-15.70	6.56	0.003	2.38-10.74
Placebo phytotherapy	9.29	< 0.0001	4.43-12.16	8.18	< 0.0001	4.12-12.23
Placebo acupuncture	7.25	0.005	2.24-12.26	4.06	0.57	-0.12-8.24

X = mean / CI (95%) = confidence interval / *t* test.
STAI = state-trait anxiety inventory.

Table 5. Means and Standard Difference of General Energy Values Generated by Ryodoraku (In µA) Before and After the Interventions in Each Study Group (Piracicaba/SP)

Group	Before	After	*p*	CI (95%)
Real acupuncture	24.56 ± 10.84	18.06 ± 8.31	0.001	2.92-10.08
Real phytotherapy	25.00 ± 13.13	17.69 ± 8.62	< 0.001	3.51-11.11
Placebo phytotherapy	23.06 ± 9.69	12.65 ± 5.74	< 0.001	6.73-14.10
Placebo acupuncture	21.56 ± 7.55	10.69 ± 6.32	< 0.001	7.08-14.67

CI (95%) = confidence interval / *t* test.

Discussion

In this study, acupuncture was as good as the phytotherapy Valerian at reducing self-reported anxiety, but with a larger effect size. Since 2002, acupuncture, an integrative practice, has been recommended in Brazil for the management of many physical signs and symptoms including acute pain [25,26], chronic pain [22,27], and psychological conditions such as insomnia [28], and depression [29,30]. This current study showed acupuncture

reduced self-reported anxiety after 5 weeks of treatment, corroborating previous findings [20,31].

The use of phytotherapy to control psychological symptoms is scientifically well known, and is popular in Brazilian culture. Many plants, such as passion fruit and chamomile [32], and pharmaceutical forms of these are used in Brazil. Systematic literature reviews have evaluated several plants with important anxiolytic effects, among them, Valerian. It promotes the safe and effective reduction of self-reported anxiety and related insomnia, without cognitive function side effects [33-36]. This was also observed in the present study.

The VAS score of the 2 therapies showed a statistically significant reduction in self-reported anxiety following the interventions; however, acupuncture had a larger effect size. Effect size is the relevance of the outcome observed, and refers to a way of quantifying the size of the difference between groups in a study. Interpretation of the effect size indicates the importance of research findings where the quantified effectiveness of an intervention can be compared with another type of intervention [37]. Although all groups had a significant reduction in VAS scores throughout the course of the treatment, only acupuncture caused a large effect. This demonstrates the magnitude of the results observed from the intervention were likely a true reflection in the real-world. The Phytotherapy Group showed moderate and small effects indicating that this observation may be due to chance. In addition, the Placebo Phytotherapy Group also showed moderate and small effects. Therefore to determine whether the reduction in anxiety due to Valerian is real, a larger sample size is required to potentially show smaller differences.

The STAI is a tool widely used to assess anxiety, both in terms of procedures, such as surgeries [18,38], and for assessment of integrative therapies, such as aromatherapy [7], and yoga [39]. The STAI is also used in acupuncture studies as it is sensitive enough to capture changes in anxiety following the procedure [31,40]. The present study observed that the sub-item State was influenced, to a larger extent, by the proposed intervention than the sub-item Trait. This was expected because the therapies were applied for 5 consecutive weeks, thereby changing the present situation of the self-reported anxious state. However, it was not sufficient, nor planned for, changing the patient's historical profile of anxiety. Nevertheless, acupuncture could be a useful tool to reduce the patients' momentary state of anxiety and could provide relief from their complaint until a time when they would be able to benefit from more structural and profound resolutions, such as the use of pharmacotherapy, if indicated.

Ryodoraku has shown that volunteers start a study with a general energy level that is below the value that is considered the normal range [23]. This was observed in the current study and was expected. Any signs or symptoms caused by external factors or psychological changes lead to stagnation and energy loss [22]. In the present study, the Acupuncture Groups ended the 1st and 2nd sessions differently; that is, acupuncture caused a reduction in energy when assessed by Bioelectrography. A drop in energy is expected after an acupuncture session [21,22], and was observed in this current study with use of the Bioelectrography method. In addition, Bioelectrography captured a reduction in stress in patients treated with acupuncture when compared with the Placebo Group (Placebo Phytotherapy).

Energy analysis techniques, such as Ryodoraku and Bioelectrography, are not typically explored by the scientific community. Energy profile analysis can reveal energy changes and imbalances that are not yet reflected in biochemically in laboratory tests, but may already be felt by the patient [21,22,41,42]. They can be used to monitor responses to various therapeutic techniques such as acupuncture, and are noninvasive, painless, safe, and quick to apply [21,41]. However, their responsible use requires clinical correlation, technical standardization, and constant dialogue with biomedical scientists for results to have therapeutic applicability [43]. The Ryodoraku and Bioelectrography measurements included in this study should be interpreted as exploratory outcomes. Although these techniques are used in some integrative medicine research contexts, robust psychometric evidence (such as standardized calibration procedures, test-retest reliability, or validated associations with psychological constructs like anxiety) is currently lacking. Accordingly, the observed reductions in "general energy" cannot be assumed to reflect physiological reorganization or therapeutic mechanisms. Any such interpretation remains hypothetical and should be viewed as preliminary, warranting further study with validated measurement frameworks. This study, conducted in a controlled manner and using Consolidated Standards of Reporting Trials standards, can be used as guidance for future publications, and contribute to the scientific reproducibility and clinical validation of these techniques.

One of the limitations of the study was that it was carried out during the COVID-19 pandemic, which caused some delays and difficulties in carrying it out. We can also mention the few available studies that used energy analysis as a parameter, especially Bioelectrography.

Another limitation of this study involves risk of bias. The present trial followed a participant- and assessor-blinded design. Participants were unaware of whether they received the real or control versions of acupuncture and phytotherapy, and outcome assessors likewise remained blinded to group allocation throughout data collection. Because the acupuncturist knew whether needles had been inserted, practitioner blinding was not feasible, and the study therefore cannot be classified as fully a double-blind trial. In addition, the phytotherapy capsules

were prepared and labeled externally by a compounding pharmacy, ensuring concealment of active versus placebo formulations. It is also important to clarify that, although the control acupuncture group underwent identical monitoring procedures, this arm functioned as an active relaxation control rather than a sham-needle procedure. Furthermore, no formal assessment of blinding success was performed, and this limitation is acknowledged for transparency. Further limitations of the study involve the use of an alphanumeric allocation sequence created manually by the research team. Although the envelopes were opaque and sealed, participants randomly selected them from a box, rather than opening them in strict numerical order. This procedure does not eliminate the possibility of selection bias, and the absence of a software-generated randomization sequence or block/stratified allocation should be considered in future studies.

Conclusion

The option of using practices such as acupuncture as a substitute for medications capable of causing side effects, and/or as an adjunct to conventional treatment, can provide relief from anxiety-related symptoms. Both the active interventions in this study, acupuncture and phytotherapy, were associated with reductions in self-reported anxiety relative to baseline. Exploratory analyses suggested a larger effect change in VAS scores in the acupuncture group than the phytotherapy group. However, these findings should be interpreted with caution due to the absence of a sham control, limited practitioner blinding, and the potential influence of expectancy effects. Ryodoraku and Bioelectrography showed generally low energy values that decreased to an even larger extent after the use of the therapies.

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Author Contributions

Conceptualization: TBA and MLRS. Methodology: TBA, GPN, and MLRS. Formal investigation: TBA and MLRS. Data analysis: MILM. Writing original draft: TBA. Writing – review and editing: TBA and MLRS.

Conflicts of Interest

The authors have no conflict of interests to declare.

Author Use of AI Tools Statement

During the preparation of this manuscript, the authors used Microsoft Copilot for checking formal grammar. All content was subsequently reviewed and revised by the authors, who accept full responsibility for the final version of the work.

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Ethical Statement

This research was reviewed and approved by the institutional review board of Research Ethics Committee of the Piracicaba School of Dentistry - FOP/Unicamp (no.: 12797119.9.0000.5418) and registered in the Brazilian Registry of Clinical Trials (code no.: RBR-72qkvy). Informed consent was obtained from all participants. Participants experiencing residual anxiety were offered active treatment after study completion.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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