Lowering anxiety of university students prior to the exams by auricular acupuncture – Preliminary study

Andrea Vieira1,7, Karine Silva3, Mariana Hinzmann1,3,Jürgen Stürmer1,8, Maria João Santos1, Nuno Correia4,5,6, Henry J. Greten1,2 and Jorge Machado1,3,9

Abstract
High-level students are exposed to various challenges that trigger high anxiety levels in relation to their academic requirements. Few studies suggest that auricular acupuncture (AA), may improve anxiety. In this study, we evaluate the potential effect of AA on the anxiety-levels of university students and also try to assess if the improvement of anxiety status is correlated with some alterations of vital signs, as blood pressure (BP), heart beat per minutes (HC), oxygen saturation (OS) and temperature (T). This study suggests that AA is effective in reducing exam-related anxiety in university-level students. Our results show that the experimental group had a reduced in the level of anxiety of just after 30 minutes, being even greater after 48 hour, with only a single auricular acupuncture treatment, when compared with control (waiting list) and placebo groups. The selected points showed to be the adequate for the treatment, since the placebo group, where unspecific points were used did not manifest any improvement; the results were even very similar to the starting point and similar to the control group. So, potentially, AA may be used as a complementary or alternative treatment for anxiety prior exams on high level students. However, this effect needs more deep scientific studies on larger samples. An additional long-term double-blinded with AA may confirm this results.

Keywords: Anxiety, Acupuncture; Auriculotherapy; Traditional Chinese Medicine; Exames.

Introduction
Anxiety is one of the most frequent clinical behavioral disorders, affecting both the physical and emotional state, inducing changes in behavior and cognition of individuals [1-4].

Regarding the emotional state, the individual can express feelings of fear, insecurity, apprehensive anticipation, catastrophic thinking and increased time of alert [1, 2, 5].

From the physiological point of view, anxiety is characterized by activation of the hypothalamic-pituitary-adrenal (HPA) axis, presenting symptoms such as insomnia, tachycardia, pallor, sweating, muscle tension, tremor, dizziness, nervousness, difficulty with concentration, intestinal disorders and epigastric discomfort [1, 2, 5, 6].

According to the diagnostic and statistical manual of mental disorders (DSM-IV), anxiety is a natural response, resulting in a sign of fundamental alert in humans, the given threat. However, anxiety can become pathologic when excessive and uncontrollable. In this sense, physical health is also compromised due to hormonal changes and consequent decrease of the immune system, which aggravates the development of various other conditions such as chronic musculoskeletal pain, respiratory diseases, cardiovascular problems, infectious and even cancer [7].

In a survey conducted by Rodrigues and Pelisolo in 2008, which included students in preparation for the final examination, it was found that 23% of the
students reported anxiety in moderate to severe degree [8]. The same authors also concluded that students attending health courses showed even higher levels of anxiety. Concomitantly, Cruz and Pinto (2010) found that 52.3% of nursing students at Viseu showed moderate anxiety, and 27.1% low-grade rated by STAY Cruz and Pinto (2010) also observed the existence of a relationship between anxiety and academic demands related to oral presentation of papers, prior the attendance or exam days, the day of examination or frequency and duration of clinical trials [9].

As Andrade and Gorenstein (1998) stated, there are several instruments formulated to assess anxiety, each of which emphasize different aspects such as mood, cognition, behavior, state of hyperalertness and somatic symptoms [3]. According to the literature, Spielberger (1970), has presented a greater emphasis on the study of anxiety in all individuals[10]. Of particular importance to determine whether an instrument will measure the trait anxiety as a characteristic condition of the individual; or the assessment of state anxiety will be in a given moment, before a given situation (e.g., school ratings) [3, 11-13].

As a means to treat anxiety, conventional medicine makes use of several drugs, such as benzodiazepines, antidepressants, barbiturates and antihistamines [14]. However, several authors (Durham & Higgins, 2012) have emphasized that Western medicine can’t solve all cases of anxiety[15]. Besides the risk of side effects, resistance to pharmacological treatment affects approximately one in three patients with anxiety disorders[16, 17].

Auricular acupuncture is a therapeutic method often used in anxiety treatments, acting directly on the nervous system, promoting the release of endorphins in the brain and melatonin’s related to relaxation, supporting the balance of the autonomic nervous system[18-22], with already very promising results, needing only the support of more scientific data to complement and validate this therapy [23].

Thus, in this context, a small student sample from an university population will be exposed to the auricular acupuncture (AA), in order to improve from their anxiety symptoms. The criteria for participation and psychopathological symptoms were previously evaluated based on specific and validated questionnaires. Few physiological parameters were also accomplished [13]. This assay should be a prospective, randomized, controlled, single-blinded study.

**Methodology**

**Selection of Students.**

This study was approved by the Ethics Committee of Piaget University from Vila Nova de Gaia, Portugal. Written informed consents were obtained from all students before study enrollment.

An experimental, prospective, randomized, controlled and single-blinded study was conducted. The sample included university students (n=18), naive to acupuncture, under no psychotropic medication, and with no known psychiatric or thyroid disorders.

**Study Design.**

Individuals were randomly allocated to the Experimental group (EG, n=8): verum AA in points (Figure 2):
1. joy,
2. lung parenchyma,
3. anxiety,
4. psychosomatic and
5. diazepam;

the Placebo group (PG, n=5): sham AA on points in neurological segments distinct from the verum AA (Figure 3):
1. articulation of the right hand,
2. foot joint right,
3. left hand joint,
4. Joint of the left foot and
5. Shoulder joint,
and the control waiting list group (WL, n=5): without
any AA treatment.

One week prior to the examination series at the
University, subjects were treated with AA using
semi-permanent needles in place for 48 hours.
Initially, the following documents were delivered to
all those interested in participating in this study: in-
formed consent, questionnaire evaluation of the cri-
teria for participation, inventory psychopathological
symptoms (BSI) [25]; Inventory trait-state anxiety
(STAI) [11, 12].

Prior to the formation of experimental groups, and
to ensure greater uniformity in the same, students
selected for the study were divided into four groups
group of students nothing anxious, a little anxious, a group of moderately anx-
ious students, and a group a very anxious students.
Assessments were made 5 minutes before (T0), 30
minutes (T1) and 48 hours after (T2) the needling
(Figure 4).

**Main Parameters:**
Level of anxiety were assessed according to the
state anxiety inventory STAI (form Y1) and a Visual
Analogue Scale (VAS) for anxiety.
Physiological parameters, as blood pressure (BP),
heart beat per minutes (HC) and oxygen saturation
(OS) and temperature (T) were taken at each study
time (0, 30 min and 48 hours) using a monitor Gold-
way UT6000A.

**Results**
Total of 18 students (13 women; 5 men) were
included, with age= 21.4±1.85 years, weight=
63.9±8.43kg, height= 1.70±0.07m and body mass
index= 22.17±4.17kg/m², from which 16.8%
showed moderate to severe states of anxiety and
14.3% trace of anxiety.

After verification of normality and homogeneity of
data, variance was held for each assessed physio-
logical parameters (blood pressure, cardiac and re-
spiratory rate), an ANOVA for repeated measures,
dependent variables: values related to physiologi-
cal parameter observed before the experimental
session and 30 minutes after the experimental
session, the independent variable: experimental
condition (study group, placebo group and control
group).
Any significant result was not observed. That is,
there were no statistic significant changes in the
values of physiological parameters HB, HC, OS
t and T collected. Possibly need other accuracy in a
larger population samples and more adequate con-
ditions and specific equipment to obtain consistent
and clear physiological results.
As for the level of anxiety data after verification of
normality and homogeneity of data variance, held a
repeated measures ANOVA (dependent variables:
state anxiety values recorded before the experi-
mental session, 30 minutes after the experimental
session and 48 hours after the trial session). The
results (Figure 5) were that after 48 hours, a big
decrease in anxiety-state values in the study group
(EG – experimental group). None of the other ex-
perimental conditions produced significant changes
in levels of anxiety (either 30 minutes or 48 hours
after experimental session).
The placebo group revealed slightly higher values
of anxiety than the control group, thought the study,
but the standard deviation is too high, to separate
these two groups (WL and PG).

**Discussion**
This study appears in a context, firstly, the sharp
interest and growing activity in the preparation of
standards that will regulate the practice of tradicio-
nal chinese medicine (TCM) and on the other hand,
a marked anxiety installed for socio-economic rea-
sions, the current flow will be the increased due to
emotional instability of many students in exams
season. However, only few studies indicate that
acupuncture, including auricular acupuncture, can
improve anxiety.
The results showed a statistically significant de-
The study evaluated the effect in the short and medium term on anxiety levels via the STAI Y1 measure. The authors found that semi-permanent needles had a higher effect than regular acupuncture needles. The results suggest that acupuncture can be an effective treatment for anxiety, especially for students. The study also highlights the need for further research on the mechanisms behind the acupuncture effect and the selection of acupuncture points. The authors also discuss the ethical and practical considerations of acupuncture treatment. Overall, the study provides valuable insights into the potential benefits of acupuncture for anxiety management.
dium term auricular acupuncture, so it is important to assess larger samples and the long-term effect in the treatment of anxiety before exams, as well as others evaluations approaches according with TCM diagnosis, variable, it would be interesting target for future studies.

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References

