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Impact Of Brain Gym Activity and Breathing Technique on Stress and Academic Procrastination Among Medical Students

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ABSTRACT

Objective:

This study aims to evaluate how medical students' stress levels and academic procrastination tendencies are affected by the Brain Gym and Breathing Technique.

Methods:

Using breathing techniques and a brain gym, we suggest a method to help medical students reduce stress and procrastination. The practice sessions will last 30 minutes each and be held three times a week. Using breathing techniques and a brain gym, we suggest a method to help medical students reduce stress and procrastination. The practice sessions will last 30 minutes each and be held three times a week.

Result:

According to the results, medical students' stress levels, procrastination, and general quality of life were all significantly improved by the Brain Gym and Breathing Technique routine. A paired t-test was used to examine the collected data. Based on the statistical findings, there was a substantial reduction in academic procrastinating behavior (p-value <0.0001) and stress (p-value <0.00001).

Conclusion:

There is a connection between stress and academic procrastination among medical students, largely due to the intense academic demands they face. This study demonstrates that implementing a structured protocol can successfully reduce stress and enhance academic performance among medical students.

Keywords: *Brain Gym Activity, Breathing Technique, Stress, Academic Procrastination, Medical Students*

1. INTRODUCTION

Education Kinesiology, also known as Brain Gym Activity, was developed by Dr. Paul Dennison and Gail Dennison in 1970. These activities employ physical movements to create a cohesive and coordinated approach to learning. Research on Brain Gym indicates that the conceptual framework for understanding brain function is typically organized along three dimensions: laterality, attention, and centering. Firstly, laterality refers to the coordination between the brain's left and right hemispheres, which is believed to be essential for various functions such as thinking, walking, hearing, writing, and communication. Additionally, the ability to focus is critical for processing information, which relates to the concepts of perception and

attention deficits. The last aspect, centering, pertains to integrating emotional and rational functions across the brain's upper and lower regions[1]. Brain gym activities enhance concentration during tasks, improve clarity of thought in specific situations, and facilitate effective problem-solving[2]. It can be described as a structured form of aerobic exercise that incorporates coordinated movements of the eyes, head, and cross-laterals, stimulating both brain hemispheres through sensory and motor cortex involvement, thereby activating our innate healing processes[3]. Breathing techniques induce a calming effect on the body, aiding in stress reduction. Breathing influences several aspects of behavior, such as motivation, physical strength, emotions, focus, perception, and memory function, in addition to balancing pH, electrolytes, blood flow, hemoglobin chemistry, and kidney function[4]. One of the initial and most effective methods to alleviate acute stress is through controlled deep breathing, which is known to affect physiological processes and transform our emotional state[5]. Procrastination refers to a behavior where students consciously or subconsciously become accustomed to delaying tasks. Many students recognize the importance of the assignments given to them, yet they still postpone their work or choose to engage in less pressing tasks[6]. Regular procrastination can lead to increased stress, anxiety, and depression. For some students, it may also negatively impact their social life, motivation, self-esteem, and heighten their fear of failure[7]. Stress is a significant concern for medical students, defined as the physical decline that occurs as the body adapts to pressure or challenging situations[8]. There exists a fundamental relationship between health, job performance, and life satisfaction; higher stress can diminish an individual's quality of life, resulting in decreased motivation, irritability, depression, and unhappiness. Consequently, their social interactions and personal lives may also be adversely affected by varying levels of stress[9]. Medical students are required to acquire and master a vast array of knowledge and skills to achieve academic success, and they face considerable stress in a highly competitive environment[10].

2. METHODS AND MATERIALS

The research investigation received authorization from the Ethical Committee and Protocol Committee (protocol number-2024). This interventional study involved 25 participants, including medical students from Krishna Vishwa Vidyapeeth in Karad, Maharashtra, India. The research initially assessed participants' stress levels. Participants were selected if they exhibited moderate to high levels of stress and procrastination. The study measured pre- and post-treatment values within the same group over a period of 6 months. The aim of this research was to evaluate the effects of brain gym activities and breathing techniques on stress and academic procrastination among medical students.

The study was conducted according to specified inclusion and exclusion criteria. Participants were informed about the study's nature, duration, and interventions in a language they understood. The subjects of this research were medical students showing signs of stress and procrastination in their academic work. Each student completed the Perceived Stress Scale and the Academic Procrastination Scale in a questionnaire format. Medical students with scores falling between moderate and high levels were included, while those who could not provide informed consent or lacked legal representation were excluded. Additionally, students with a psychological history or who had been practicing the techniques were not part of the study. The research protocol was carried out three times a week for at least half an hour each session, over a duration of 4 weeks.

Outcome Measure:

1. **Perceived Stress Scale:-**

- The Perceived Stress Scale (PSS) is a classic stress assessment instrument. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question.
- You can determine your PSS score by following these directions:
- First, reverse your scores for questions 4, 5, 7, and 8. On these 4 questions, change the scores like this: 0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0.
- Now add up your scores for each item to get a total. My total score is _____.
- Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.
    - Scores ranging from 0-13 would be considered low stress.
    - Scores ranging from 14-26 would be considered moderate stress.
    - Scores ranging from 27-40 would be considered high perceived stress.

2. **Academic Procrastination Scale:-**

- It contain a questionnaire-based scale related to academic procrastination. This scale consist about study habits, homework completion, exam preparation and participation in extracurricular activities.
- Each statement is rated on a Likert scale, which consist of options like strongly agree, agree, uncertain, disagree

and strongly disagree.

- The score of all 25 statement is added to get raw score.

Raw Score Range	Procrastination Level
Low Score (below 50%)	Low Procrastination
Moderate Score (50-70%)	Moderate Procrastination
High Score (above 75%)	High Procrastination

Treatment

Structure Protocol: 3 times a week for half hour; for 4 weeks duration.

Participants in the interventional trial had demonstrated moderate to high levels of stress and procrastination tendencies in their academic work. There are eight motions in all, and you should do them three or four times a week at minimum. Before the protocol started, a pre-test was administered, and at the end of the fourth week, a post-test was administered.

In the first week: -

- The program starts with **Marching in Place**, where students are instructed to stand upright and lift each leg alternately. This serves as a warm-up exercise lasting 2-3 minutes.
- **Cross-crawls** are executed to enhance coordination between both sides of the brain. This exercise is performed for 2-3 minutes in three sets of four repetitions, where students stand straight, lift one leg to chest level, and touch the knee with the opposite elbow.
- **Cook's hook up** aims to stimulate neurons and improve the balance between hand and brain. For this activity, students cross their arms, fix their fingers together, and rotate their hands internally for a duration of 3-4 minutes.
- **Brain buttons** involve gently massaging two points below the collarbone on either side of the sternum, with the other hand resting on the belly. This exercise stimulates the brain and nervous system, aiding in focus and alertness. Students perform this for 3 minutes with five repetitions.
- **Lazy Eight** helps enhance eye movement coordination, attention span, and eye-hand coordination. Students are directed to extend their hands and trace a horizontal figure eight in front of them for 2-3 minutes, completing three repetitions.
- **Energy Yawns** assist in relaxing the jaw, alleviating tension, and boosting alertness. This includes gentle yawning and massaging the jaw muscles, where students place their fingertips on the TMJ joint and massage in circular motions for 1-2 minutes.
- **Positive Points** contributes to memory enhancement and stress reduction. Students are instructed to breathe deeply while gently pressing their closed eyelids for 1 minute, completing ten repetitions, which stimulates lateral and side-to-side coordination.
- **Thinking Caps** are designed to enhance learning speed, improve mood, increase attention span, and boost memory. Students press at the top and bottom of their ears continuously for the duration of 1 minute, performing five repetitions.
- **Deep Breathing** is practiced at the end to foster relaxation, improve lung capacity, and raise energy levels. Students are asked to sit comfortably and engage in deep breathing for 5 minutes.

In the second, third, and fourth weeks, the same exercises were conducted with progressively increased time and repetitions. A pre-test was administered before the start of the first week, and a post-test was conducted at the end of the fourth week. This structured method enabled a gradual reduction in stress and academic procrastination among medical students, thereby enhancing their academic performance and boosting self-esteem.

3. RESULTS

An Excel spreadsheet was used to enter the data, and the Instat software was used to perform statistical analysis. To determine significant differences between the pre-post interventional group across outcome measures, descriptive statistics and paired t-tests were used.

Score of Perceived Stress Scale	PRE	POST	p-value	t-value
	24.2±6.021	17.88 ±5.278	<0.00001	4.695

Interpretation

The results indicate a **statistically significant reduction in perceived stress levels** following the intervention. The **mean PSS score** decreased from **24.2 ± 6.021 (PRE) to 17.88 ± 5.278 (POST)**, reflecting a notable improvement in stress perception. The **p-value (<0.00001)** confirms that this change is highly significant and unlikely due to chance, while the **t-value (4.695)** further supports the substantial difference between pre- and post-intervention scores. These findings suggest that the intervention was effective in reducing stress levels, potentially through improved coping mechanisms, relaxation techniques, or behavioural modifications.

Score of Academic Procrastination Scale	PRE	POST	p-value	t-value
	65.72±9.762	54.64 ±8.087	<0.0001	7.084

Interpretation

The results indicate a **statistically significant reduction in academic procrastination** following the intervention. The **mean Academic Procrastination Scale score** decreased from **65.72 ± 9.762 (PRE) to 54.64 ± 8.087 (POST)**, reflecting a considerable improvement in procrastination tendencies. The **p-value (<0.0001)** confirms that this reduction is highly significant and unlikely due to chance, while the **t-value (7.084)** further supports the substantial difference between pre- and post-intervention scores. These findings suggest that the intervention was effective in **reducing procrastination behaviours**, potentially through enhanced time management skills, motivation strategies, or behavioural modifications.

4. DISCUSSION

The objective of this study design was to assess the relevance of a protocol established for Medical Students dealing with stress and tendencies towards academic procrastination. We employed the Perceived Stress Scale and the Academic Procrastination Scale for this purpose. Our hypothesis stated that improvements in behaviours would be observed in medical students alongside a reduction in stress levels. The research aimed to forecast the effects of brain gym activities and breathing techniques on both stress and academic procrastination behaviours.

Research suggests that students with lower academic performance are more prone to procrastination, sluggishness, and making hasty decisions regarding time management[11]. Students encounter various academic difficulties, including adapting to the college setting, rigorous study schedules, frequent examinations, and inadequate preparation time[12]. Consequently, some students delay their tasks and experience heightened stress during crucial periods of activity. Excessive stress within medical school can lead to academic dishonesty and difficulties in handling interpersonal relationships. Diminished attention, concentration, and objectivity can cause errors and inappropriate actions, resulting in negligence[13]. In response, Dr. Chaitanya Kulkarni conducted a research study on brain gym activities involving 60 young adults aged 18-24 to improve their cognitive capabilities.

Before the intervention, the participants' attention span was assessed at a sixth-grade level. After a month of performing daily exercises at home, significant improvements were observed in their attention span (p-value = 0.0001), which correlated with enhancements in academic grades to 3 and 2[14]. Brain Gym serves as an excellent tool for personal growth, facilitating rapid transformations and elevating quality of life across various age groups[15]. Breathing techniques are widely utilized for relaxation and stress management, helping to control psychophysiological states and enhance organ function[16]. Mindful breathing and SLOW practices can contribute to reducing psychological stress and fostering mental well-being[17].

Brain gym exercises form cerebral connections similarly to how nature operates through movement. Furthermore, these activities enhance learning and performance capabilities and assist learners facing specific learning and behavioural challenges. Participants frequently report enhanced self-confidence, self-esteem, coordination, and communication skills as a result of engaging in brain gym exercises. Over 50% of neurons are involved. Soothing and calming the nervous system, particularly the jaw muscles, can alleviate stress and tension, ultimately improving sensory input[14].

5. CONCLUSION

The finding of the study clearly demonstrate that incorporating Brain Gym Activities along with Breathing Techniques can have a significant positive impact on the mental well-being of medical students. These practices were found to effectively reduce stress levels and minimize tendencies towards academic procrastination, which are common challenges faced by students in demanding educational environments. Furthermore, the use of these techniques was associated with improvement in cognitive functions such as increased attention span and focus. As a result, students were able to perform better in academic and daily tasks. Overall, the study highlights the potential of simple, non-invasive interventions like Brain Gym and Breathing Technique to enhance both mental performance and general activity levels among medical students, thereby contributing to their academic success and personal development.

Limitation

The study only included students from Krishna Vishwa Vidyapeeth, had a small sample size, and had a short methodology. Furthermore, it's possible that some students completed the activities improperly, which could have impacted the outcomes.

Conflict of Interest

There are no conflicts of interest related to this work, according to the authors.

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