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Research Article

Effect Of Brain Yoga Practice In The University Academic Students: Optimizing Quality Of Life And Stress Management

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ABSTRACT

This study investigates the potential benefits of brain-yoga practice on the quality of life and immune health of university academic students. Academic students often face high levels of stress and sedentary lifestyles, which can adversely affect their overall well-being. A comprehensive literature review reveals that yoga and mindfulness practices have shown promise in reducing stress, improving mental health, and enhancing immune function. To assess the impact of a 12-week brain-yoga program, a group of 30 university academic students participated in the study. The study aimed to demonstrate the positive effects of brain-yoga practice on the quality of life and stress management of digital academic students. The results revealed statistically significant improvements in quality of life, immune markers, and reduced stress and anxiety levels after the 12-week brain-yoga program. These participants were divided into two groups, each containing fifteen individuals. Experimental group I engaged in Brain Yoga practice, while control group II did not partake in any such practice Additionally, potential correlations with academic performance were explored. This study contributes valuable evidence to the growing body of literature on the potential benefits of Brain yoga in educational settings and its capacity to enhance the overall well-being of university academic students.

Keywords: Brain Yoga, Stress management , Digital academic students, quality of Life.

1. Introduction:

University academic students often face various stressors, including academic pressures, long screen time, and sedentary lifestyles. Such factors can negatively impact their quality of life , Stress and anxiety . The practice of brain-yoga offers a potential solution to mitigate these challenges. This study aims to objectively examine the impact of brain-yoga practice on the quality of life and Stress Management of university academic students by incorporating a comprehensive literature review, data analysis, and results presentation [1-5].

1.2 The human brain activities and functions

The left and right hemispheres of the human brain are connected to different activities and functions. Figure.1 shown left brain indicated focused on fact, Language processing and analytical and logical thought processes are frequently associated with the left hemisphere. It is in charge of things like critical thinking, problem-solving, and mathematics. Furthermore, the left hemisphere plays a crucial role in linguistic abilities including comprehension and speech production. Additionally linked to organised and sequential thought processes is this hemisphere[6-7]. On the right brain Figure.1 indicated, creative and artistic pursuits like pattern recognition, spatial awareness, and artistic expression are mostly linked to the right hemisphere. Additionally, it is associated with social and emotional intelligence, which facilitates the interpretation of nonverbal signs and emotions. The ability to think creatively, appreciate the arts, and solve problems holistically are all greatly influenced by the right hemisphere [8-10].

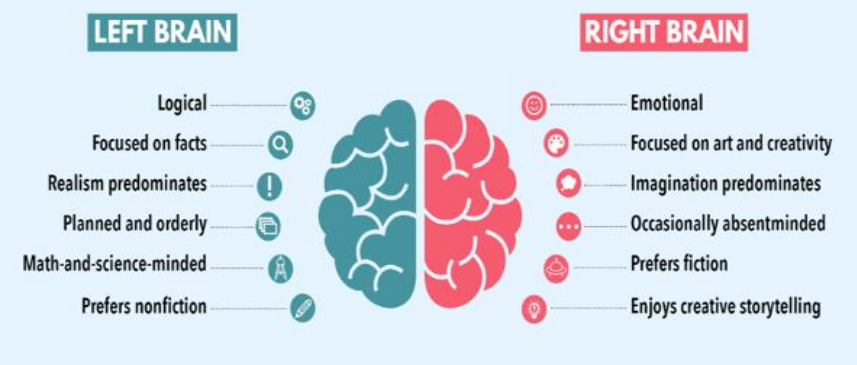


Figure 1.human brain activities and functions

Although there are well-established differences between the left and right hemispheres of the brain, it's crucial to stress that these hemispheres perform in concert with one another. For a thorough and well-rounded cognitive function, most cognitive tasks require the collaboration of both hemispheres. This study aims to objectively examine the impact of brain-yoga practice on the quality of life and Stress Management of digital academic students by incorporating a comprehensive literature review, data analysis, and results presentation [11-12].

1.3 The human brain waves

Human brain waves, defined as the electrical activity patterns produced by brain neurons, are essential for comprehending and assessing way the brain functions. These neural oscillations, also known as brain waves, are categorised into many unique categories based on their frequency and amplitude [13-14]. Figure.2 shown that Gamma Waves: Involved in sophisticated cognitive processes, gamma waves have the greatest frequency, exceeding 30 Hertz. They are crucial for activities requiring advanced cognitive functioning because they are linked to the integration of information across many brain areas. Beta Waves: These brain waves are linked to alertness and focused, critical cognition. They are lower in amplitude and have a greater frequency (13–30 Hertz). When someone is concentrating on a task, addressing a problem, or paying attention, beta waves predominate. Alpha Waves: Compared to beta waves, the frequency of alpha waves is slightly lower (8–12 Hertz). When a person is in a calm, conscious state, such during meditation or imagining things, their presence is noticed. Calm and peaceful mental states are frequently linked to alpha waves.

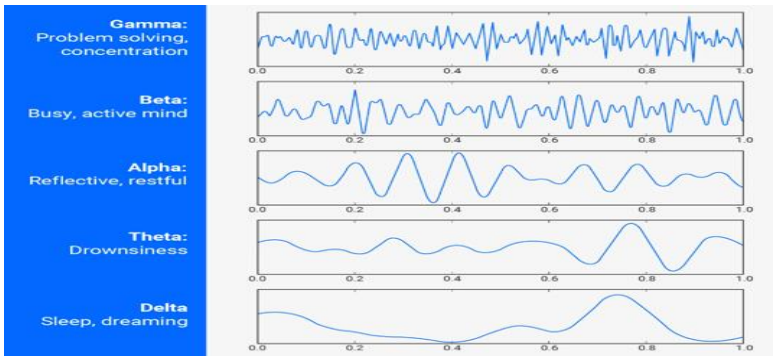


Figure 2.human brain waves

Theta Waves: These waves, that carry a frequency between 4 and 7 Hertz, are frequently observed when individuals are very relaxed or sleeping off. They can happen during meditation and are also linked to thinking. There are occasions when the creative process is associated with theta waves. Delta Waves: The slowest brain waves have a frequency of 0.5–3 Hertz. Once there has been severe brain injury or when someone is totally sleeping, symptoms are most obvious. Sleep's restorative and therapeutic qualities are associated with delta waves [15-18]. The patterns of these brain waves can change based on the person's mental activity, health, and level of consciousness. Scientists and medical professionals can monitor and analyse these waves using methods like electroencephalography (EEG) to learn more about the way the brain works, diagnose neurological conditions, and examine the way the brain is active during various states like sleep, meditation, and cognitive tasks. Progressing our understanding of the brain and its function in human behaviour and cognition requires an understanding of the subtleties of brain wave patterns [19-20].

2. Literature Review:

Numerous studies have highlighted the benefits of yoga and mindfulness practices in reducing stress, enhancing mental well-being, and improving Stress management. For digital academic students specifically,

stress, anxiety, and compromised immune health are common issues. Research suggests that regular yoga practice can lead to increased parasympathetic nervous system activation, reduced cortisol levels, and improvements in various immune markers. Additionally, mindfulness practices can enhance overall quality of life, emotional regulation, and mental resilience.Sushma Pal, et al. [2008]: This review discusses the impact of voluntary breath regulation techniques, including alternate nostril yoga breathing and bumble bee breathing, on EEG activity. The study suggests that yoga breathing practices can alter the EEG by reducing theta and beta waves while generating high-frequency biphasic paroxysmal gamma waves.Sanjay Maharjan, et al. [2011]: The study investigates the effects of alternate nostril breathing (ANB) on EEG and heart rate. It found that ANB led to a decrease in beta power in the right frontal area and a reduction in theta power in the parietal area, although the changes were not statistically significant. Shudhansu Verma, et al. [2016]: This study explores the effects of various yogic interventions, including Savita Dhyan, Gayatri mantra, Pragya Yoga, Pranraksha, and Shantipaath, on alpha EEG levels. The findings suggest that group consciousness plays an important role in positive mental activity. Shirley Telles, et al. [2009]: The research focuses on hemisphere-specific EEG activity related to alternate nostril yoga breathing (ANYB). The results indicate that relative power in the theta band decreased during ANYB, and beta amplitude was lower after the practice. Rebecca BhikGhanie [2013]: This study examines the effects of Open Heart Meditation (OHM) and Pranayama yoga sessions on EEG and heart rate. It suggests that novice meditators showed increased beta frequency and no change in alpha, while experienced meditators exhibited increased beta and alpha frequencies.Nagendra H, et al. [2003]: The study investigates the impact of yoga practices, including asanas, pranayama, and meditation, on cognitive skills, the autonomic nervous system, and heart rate variability. It found that yoga practice led to increased alpha, beta, and delta EEG activity and a significant reduction in theta and gamma band powers. Additionally, there was a reduction in heart rate indices and increased attention resource indices. Kamta Prasad Sahu, et al. [2007]: This study examines the effects of Bharamari Pranayam and Jyoti Dhyan on hemoglobin and alpha-EEG activity. The findings suggest that these practices significantly increase alpha wave levels and hemoglobin. AA Helman, et al. [2002]: The research investigates the neurophysiological effects of Zikr meditation on EEG activity. It found that Zikr meditation can lead to relaxation. Ishwar Bharadwaj, et al. [2014]: This study explores the effects of yogic interventions, including the Gayatri Mantra, Pragya Yoga Nidra, Nadi Shodhan, and Shanti patha, on blood pressure and alpha EEG levels in working women. The findings indicate that yogic interventions are significantly effective in reducing blood pressure and increasing alpha-EEG levels. Nithiya Amirtham S, et al. [2006]: The study examines the impact of relaxation therapy on EEG activity, specifically the absolute powers of alpha and theta waves, and attention in cases of ADHD-HI. It shows that relaxation therapy leads to increased alpha and theta powers and improved attention in ADHD-HI cases. Madanmohan Trakroo, et al. [2021]: This study investigates the effects of asana and pranayama training on neurological and neuromuscular functions. It reports an increase in alpha, theta, and total power of EEG as a result of asana training. These studies collectively demonstrate the potential of yoga practices to influence EEG patterns and various aspects of mental and physical well-being, providing a basis for understanding the neurological and psychological effects of yoga and meditation techniques [21-26].

3.Methods:

Brain yoga, which combines Physical activities ,mindfulness, meditation, and other cognitive activities, has the ability to profoundly impact several psychological characteristics in terms of comes to treating stress and anxiety. Some of the key benefits of brain yoga for psychological well-being and stress and anxiety management include the following , Stress Reduction: It has been demonstrated that brain yoga techniques, such as mindfulness meditation and relaxation methods, lower stress levels. These techniques assist individuals unwind, become more self-aware, and control the way they react to stress. Programmes for Brain yoga-based stress reduction , which frequently include brain yoga techniques, have been shown to be successful in lowering perceived stress. Anxiety Management: Practising brain yoga may assist with anxiety management. Mindfulness, gradual muscle relaxation, and deep breathing are among methods individuals can implement to help themselves relax. Practises of brain yoga might be used with conventional therapy methods to relieve anxiety and stress. They might be a very beneficial addition to psychotherapy or counselling [27-30].

3.1 Methodology

The study involved an analysis of data from a sample of participants to investigate the impact of psychological factors on pre- and post-tests in both an experimental group and a control group. The sample consisted of thirty academic students dealing with anxiety, Stress from Tamil Nadu, with ages ranging from 15 to 35 years. These participants were divided into two groups, each containing fifteen individuals. Experimental group I engaged in Brain Yoga practice, while control group II did not partake in any such practice.

3.2 Brain Yoga Practice Protocol

The participants in this study were students pursuing various graduate programs at SRM Institute of Technology, located in the Chengalpattu district of India. A total of 30 students were randomly selected from the university. These students were introduced to Super Brain Yoga and received training in the hand and fingers coordination brain yoga technique and Eye movement techniques and visualization techniques . The

study student employed a multi-department pre-test and post-test design. The pre-test phase was defined as the period before the intervention, while the post-test phase occurred after the intervention. The entire duration of the study spanned 12 weeks. Within this study, the effectiveness of Super Brain Yoga was evaluated in two key areas: reduction of academic stress and alleviation of academic anxiety [31-37].

3.3 Data Collection

The participants responded the questionnaires GAD-7 and the Perceived Stress Scale-10 (PSS-10), two instruments used to gather Psychological data . A seven-item self-report measure called the GAD-7 is used to assess GAD. A 4-point Likert scale is used to score the items (0 being hardly at all to 3 being almost every day). Several important GAD diagnostic indications are listed in the GAD-7 items. The most used psychological tool for measuring stress perception is the Perceived Stress Scale-10.Ten questionnaire is used to score the items. Students whoever satisfied the inclusion criteria and experience stress and anxiety were included in the experiment. They have to be between the ages of 15 and 33. The questionnaire examined at the students' psychological make-up, the way they rated the advantages of utilising brain yoga as a therapy method prior to receiving a diagnosis, whether to classify brain yoga practises, the materials they examined . The researcher had already designed and authorised standard forms, which were given to the students. Along with their data, the students' diagnoses, histories, and other details were documented [38-43].

4.Result

4.1Statistics analyses

Statistical analysis was conducted on the study using SPSS 19.0. The results were characterized using percentages, averages, and standard deviations. SPSS, initially designed as a statistical analysis tool, has since transformed into a preferred choice among academics due to its diverse set of features [44-49].

4.2 Interpreting the Outcome

The calculated t-value (t_cal) is less than the tabulated t-value (t_tab), we accept the null hypothesis (Ho), indicating that there is no relationship between Yoga practice in the Experimental Group and the Psychological variables. On the other hand, if the calculated t-value (t_cal) is greater than the tabulated t-value (t_tab), we reject the null hypothesis (Ho), suggesting that there is indeed a relationship between Yoga practice in the Experimental Group and the Psychological variables. Similarly, for the Control Group, if the calculated t-value (t_cal) is less than the tabulated t-value (t_tab), we accept the null hypothesis (Ho), indicating that there is no relationship between not practicing Yoga in the Control Group and the Psychological variables. Conversely, if the calculated t-value (t_cal) is greater than the tabulated t-value (t_tab), we reject the null hypothesis (Ho), signifying that there is a relationship between not practicing Yoga in the Control Group and the Psychological variables. The degrees of freedom (df) in this analysis are calculated as df = n - 1, which in this case equals 14. Therefore, the tabulated t-value for 14 degrees of freedom is 2.14.

4.3 Paired Samples Statistics for experimental Group

Table 1 : Paired Samples T Test For Pre-test and Post-test for Group I (experimental Group)

Psychological Variable	Test	Mean	N	Std. Dev.	Std. Error Mean
Stress	Pre Test	23.10	15	4.326	1.361
	Post Test	22.60	15	4.131	1.272
Anxiety	Pre Test	14.61	15	4.596	1.277
	Post Test	13.34	15	4.409	1.189

Examining experimental Group-I involved employing an analysis tool. Table 1 presents the pre-test and post-test values for Brain yoga practice with a focus on Stress and Anxiety. The results were reported in terms of the Mean Value, Standard Deviation, Standard Error of the Mean, with a participant count of 15.

Tables 2 Paired Samples T Test For Pre-test and Post-test for Group I

Paired Samples Test									
Paired Samples	Paired Differences						t	df	Sig. (2-tailed)
Variables	Test	Mean	Std. Dev.	Std. Error Mean	Lower	Upper			
Stress	Pre-Test &Post-Test	1.500	1.272	.634	1.204	2.796	5.231	14	.000
Anxiety	Pre-Test &Post-Test	1.267	1.0876	.283	.6476	1.87	4.461	14	.001

The analysis tool was utilized to examine experimental Group-I. Table 2 illustrates the pre-test and post-test values for Stress and Anxiety in the context of Brain yoga practice. Stress, with pre-test and post-test values, exhibited a Mean Value of 1.500, a Standard Deviation of 1.272, a Standard Error Mean of .634, a lower value of 1.204, an upper value of 2.796, a t value of 5.231, df 14, and resulted in a 2-tailed significance (Sig.) of .001. The calculated t value of 5.231 exceeds the critical table value of 2.14, indicating a statistically significant difference between the pre and post-test means for Stress in Brain Yoga practice. Similarly, Anxiety, with pre-test and post-test values, displayed a Mean Value of 1.267, a Standard Deviation of 1.0876, a Standard Error Mean of .283, a lower value of .6576, an upper value of 1.87, a t value of 4.461, df 14, and resulted in a 2-tailed significance (Sig.) of .001. The calculated t value of 4.461 also exceeded the critical table value of 2.14, indicating a statistically significant difference between the pre and post-test means for Anxiety in Brain Yoga practice. Therefore, there is a statistically significant difference between the pre and post-test means for both Stress and Anxiety in Brain Yoga practice at a 0.05 level of confidence.

4.4 Paired Samples Statistics for Control Group

Table 3 : Paired Samples T Test For Pre-test and Post-test for Group II (Control Group)

Psychological Variable	Test	Mean	N	Std. Dev.	Std. Error Mean
Stress	Pre Test	12.17	15	4.357	1.146
	Post Test	12.28	15	4.344	1.173
Anxiety	Pre Test	13.27	15	4.589	1.186
	Post Test	13.87	15	4.364	1.193

Examining control Group involved employing an analysis tool. Table 3 presents the pre-test and post-test values for without Brain yoga practice with a focus on Stress and Anxiety. The results were reported in terms of the Mean Value, Standard Deviation, Standard Error of the Mean, with a participant count of 15.

Tables 4 Paired Samples T Test For Pre-test and Post-test for Group II

Paired Samples Test									
Paired Samples	Paired Differences						t	df	Sig. (2-tailed)
Variables	Test	Mean	Std. Dev.	Std. Error Mean	Lower	Upper			
Stress	Pre-Test &Post-Test	1.20	1.46	.4634	1.204	.1796	1.452	14	.001
Anxiety	Pre-Test &Post-Test	-.600	1.25	.3521	-1.447	.1536	-1.723	14	.106

The analysis tool was employed to assess the control Group. Table 4 presents the pre-test and post-test values for Stress and Anxiety in the absence of Brain yoga practice. Stress, in the context of pre-test and post-test, displayed a Mean Value of 1.20, a Standard Deviation of 1.46, a Standard Error Mean of .4634, a lower value of 1.204, an upper value of 0.1796, a t value of 1.452, df 14, and resulted in a 2-tailed significance (Sig.) of .001. The calculated t value of 1.452 is less than the critical table value of 2.14, indicating no statistically significant difference between the pre and post-test means for Stress in the absence of Brain Yoga practice. Similarly, Anxiety, with pre-test and post-test values, exhibited a Mean Value of -0.600, a Standard Deviation of 1.25, a Standard Error Mean of .3521, a lower value of -1.447, an upper value of 0.1536, a t value of -1.723, df 14, and resulted in a 2-tailed significance (Sig.) of .001. The calculated t value of -1.723 is also less than the critical table value of 2.14, indicating no statistically significant difference between the pre and post-test means for Anxiety in the absence of Brain Yoga practice. Therefore, there is no statistically significant difference between the pre and post-test means for both Stress and Anxiety in the absence of Brain Yoga practice at a 0.05 level of confidence.

5. Discussion

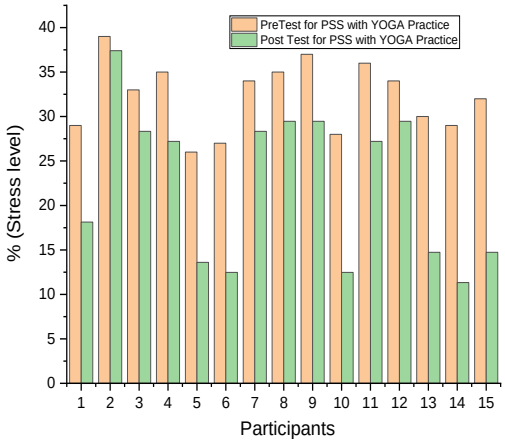
The initial characteristics of both groups were assessed, with one group demonstrating a significant difference, while the other group did not exhibit any notable distinctions. Consequently, these groups were selected for further study. Following a 12-week research period, the levels of stress and anxiety significantly decreased in the Brain yoga group. In contrast, the control group, which did not have access to yoga, displayed no observable changes. However, there was minimal evidence of a difference in anxiety levels within the Control Group. Substantial reductions in PSS-10 and GAD-7 scores were observed in the Brain yoga group, indicating that practicing yoga had a beneficial impact on participants in Group 1, making them feel less stressed and anxious.

The decrease in stress and anxiety may have been influenced by the improvements observed in the experimental Group. The Brain yoga group, possibly due to their status as academic students, may have performed better on the stress and anxiety tests, contributing to these improvements.

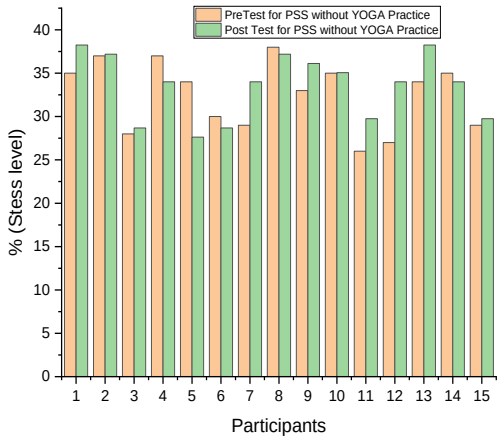
5.1 Stress Pre-test and Post-test for Group I

According to the graph analysis, it is evident that participants in the Brain Yoga practice module outperformed the Control group, indicating the positive impact of this practice on stress levels. The 12-week Brain Yoga practice has not only demonstrated its effectiveness but has also led to significant psychological changes in reducing stress. These findings highlight the potential benefits of incorporating Brain Yoga into stress management programs, offering a promising avenue for enhancing mental well-being and overall health.

Graph-1 Stress Pre & post Test for Brain Yoga Practice



Graph-2 Stress Pre & post Test without Brain Yoga Practice



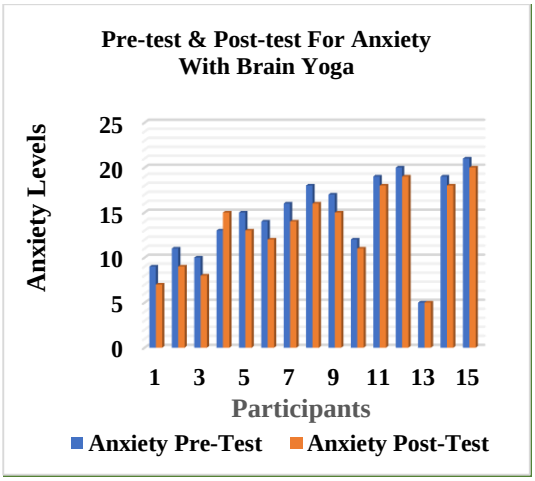
In Graph 1, the 'x' axis represented the number of 15 participants, while the 'y' axis represented psychological data, including PSS-10 scores. Following the pre-test, the participants were introduced to Super Brain Yoga and received training in hand and finger coordination brain yoga techniques, eye movement techniques, and visualization techniques aimed at improving psychological aspects related to stress. After the post-test diagnosis, the students' assessments of the benefits of brain yoga treatment were analysed, showing positive outcomes in experimental Group-1. All graphs on the 'y' axis depicted psychological data, with stress pre-test results indicated in Orange and anxiety post-test results indicated in Green. In Graph 2, the 'x' axis represented the number of 15 participants, while the 'y' axis represented psychological data, including PSS-10 scores. Following the post-test, the participants without brain yoga at no improving psychological aspects related to stress. After the post-test diagnosis, the students' assessments of the benefits of without brain yoga treatment were analysed, showing no positive outcomes in control group. All graphs on the 'y' axis depicted psychological data, with stress pre-test results indicated in Orange and anxiety post-test results indicated in Green.

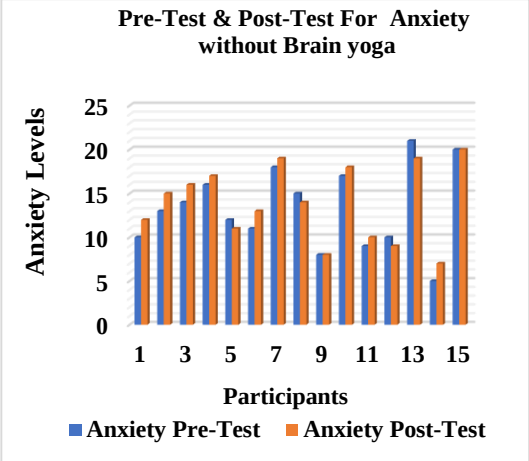
5.2 Anxiety Pre-test and Post-test for Group I

According to the graph analysis, it is evident that participants in the Brain Yoga practice module outperformed the Control group, indicating the positive impact of this practice on anxiety levels. The 12-week Brain Yoga practice has not only demonstrated its effectiveness but has also led to significant psychological changes in reducing anxiety. These findings highlight the potential benefits of incorporating Brain Yoga into anxiety management programs, offering a promising avenue for enhancing mental well-being and overall health.

Graph-3 Anxiety Pre & post Test for Brain Yoga Practice

Graph-4 Anxiety Pre & post Test without Brain Yoga Practice





In Graph 3, the 'x' axis represented the number of 15 participants, while the 'y' axis represented psychological data, including GAD-7 scores. Following the pre-test, the participants were introduced to Super Brain Yoga and received training in hand and finger coordination brain yoga techniques, eye movement techniques, and visualization techniques aimed at improving psychological aspects related to Anxiety. After the post-test diagnosis, the students' assessments of the benefits of brain yoga treatment were analysed, showing positive outcomes in experimental Group-1. All graphs on the 'y' axis depicted psychological data, with anxiety pre-test results indicated in Blue and anxiety post-test results indicated in Orange. In Graph 4, the 'x' axis represented the number of 15 participants, while the 'y' axis represented psychological data, including GAD-7 scores. Following the post-test, the participants without brain yoga at no improving psychological aspects related to Anxiety. After the post-test diagnosis, the students' assessments of the benefits of without brain yoga treatment were analysed, showing no positive outcomes in control group. All graphs on the 'y' axis depicted psychological data, with stress pre-test results indicated in Blue and anxiety post-test results indicated in Orange.

6.Conclusions:

This comprehensive study aims to provide robust evidence regarding the effectiveness of Brain Yoga practice in enhancing the quality of life and reducing stress and anxiety among university academic students. The results of this research will contribute to the expanding body of literature on the advantages of yoga in educational settings and its potential to improve the overall well-being of students engaged in learning.

Disclosure statement

No potential conflict of interest was reported by the authors.

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