

YOGIC INTERVENTION FOR ASSESSING COGNITIVE ABILITIES AND ANXIETY LEVEL AMONG EXPERIMENTAL GROUP

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Abstract:

This study aims to examine the effect of a yogic practice on the cognitive functions and anxiety levels of a set of 8 students age group 18 – 22 at school of yoga, Ranchi University under the larger theme study "Chances of Mental Deviation in Attempting Samadhistha". Psychological tests used in the intervention were the Wechsler Adult Intelligence Scale (WAIS) to evaluate a person's cognitive skills and the State-Trait Anxiety Inventory (STAI) to assess anxiety. The participants were pre- and post-tested with an intervention period of 3 months in between. To assess the changes in cognitive function and anxiety during the intervention period, statistical analyses were done. The findings offer insights into the possible effects of yogic practices on cognitive function and anxiety management, and their significance for mental health and attainment of Samadhi. The findings from this study can help to deepen the understanding of the relationship between yogic practices, cognitive functioning and mental states, providing implications for holistic approaches to mental health and spiritual development.

Keywords: Mental & spiritual growth, intelligence level, consciousness, Spiritual transcendence, State anxiety, Trait anxiety, Cognitive abilities.

Preface:

I began my exploration of the complex interaction between yogic disciplines, cognitive function, and mental health, and entered into a space where science meets spirituality. This preface is a summary of the spirit of my search, highlighting the motivations, methods and hopes behind my exploration. This research project began with the ancient yogic teachings and their reveal of the transformative nature of the disciplined practice on the human psyche. After an inspiration to learn yoga and an eagerness to explore the capabilities of yogic interventions in promoting mental balance and spiritual development, I set out to investigate this. This preface is like a seed scattering seed that begins with a careful examination of the human condition, a contemplation of values, and an investigation of questions. This preface is a seed that sows seeds: seeds of

academic inquiry, of spiritual searching, of a critical examination of human conditions, of a consideration of values, of an exploration of questions. It explains the purpose and focus of the research and the aims that were set by the researcher, as well as the methods used in gathering data and analysing the data that were used to the research and what the significance of the findings were in the wider context of contemporary psychological research. In this introduction, I hope to share with you the journey of discovery I have undertaken, and which you will accompany on the paths of science and spirituality, to shed light on the ways to achieve inner peace, mental clarity and spiritual elevation. So let's reach for the stars with our minds and attempt to understand the mysteries of mental wellness in the light of yogic knowledge.

Methodology apply:

1. The Wechsler Adult Intelligence Scale (WAIS): a test that is standardized and measures cognitive functioning in adults. It contains a number of subtests which measure different areas of intelligence. The following is a brief description of each of the subtests and the principles for scoring them:
 - (i) Digit Span (Forward and Backward): One point will be given for each correct answer. The length of the digit sequences given in the subtest determines the maximum score. If the number of digits to be memorized is from 2 to 9, then the highest possible score would be 8 per subtest. Vocabulary
 - (ii) This subtest usually will have 35 items. One point will be awarded for every correct definition. Thus, the Vocabulary subtest will have a maximum score of 35.
 - (iii) Block Design: There are 6 items for Block Design subtest. You will get 1 point for every successfully reproduced pattern of blocks. Hence, the highest possible score in the Block Design subtest is 6.
 - (iv) Symbol Search: There are 60 items in the Symbol Search subtest. One point is given for each target symbol correctly identified. The highest possible mark for this subtest is 60.

2. State-Trait Anxiety Inventory (STAI):

The STAI is a self-report inventory of state anxiety (temporary emotional response) and trait anxiety (general and lasting tendency to be anxious). It is made up of two subscores for state and

trait anxiety. The participants answer the anxiety level of their anxiety symptoms on a Likert scale. The score for each scale is a range of 20 to 80, with higher scores denoting greater anxiety.

Likert scale ranging from 1 to 4 for state anxiety:

- 1 = Not at all
- 2 = Somewhat
- 3 = Moderately
- 4 = Very much so

Trait Anxiety Likert Scale ranging 1-5 :

- 1=Strongly Disagree
- 2= Disagree
- 3=Neutral
- 4=Agree
- 5= Strongly Agree

3. Yogic Intervention: Following the baseline assessments, participants engaged in a structured yogic intervention program conducted by certified yoga instructors. The intervention comprised a combination of asanas, pranayama, meditation, and relaxation techniques tailored to enhance mental clarity and reduce anxiety levels.

SL.NO.	YOGIC TECHNIQUE		Age Group(Yrs)	Periods [3Months]	Duration
1.	Sukhsma Bayam		14-17 & 18-22	Morning & Evening	15-30mins.
2.	Cleansing Techniques [Neti & Kunjan]		14-17 & 18-22	Weekly(Morning)	1Hr.
3.	OM Chanting		Both Groups	Evening	5mins.
4.	P R A N A Y A M	Anulom Vilom	14-17 Years	Morning & Evening	15 mins.
		Nadi Sodhan	18-22Years	Morning & Evening	15mins.
		Kapal Bhati	Both groups	Only morning	15mins.
		Bhramari	14-17 Years.	Only Evening	10mins.

4. Hypothesis Testing : Quantitative data obtained from the psychological tests were analyzed using appropriate statistical methods, including paired t-tests, to compare pre and post-

intervention scores. Additionally, qualitative feedback from participants regarding their experiences during the intervention was collected and analyzed to provide further insights into the effects of the yogic practices.

5. **Post-Intervention Assessment:** Upon completion of the 3-month intervention period, participants underwent post-intervention assessments using the same psychological tests administered at baseline (WAIS and STAI). These assessments aimed to evaluate any changes in cognitive abilities and anxiety levels following the yogic intervention.
6. **Ethical Considerations:** The study adhered to ethical guidelines for research involving human participants, ensuring informed consent, confidentiality, and voluntary participation. Ethical approval was obtained from the relevant institutional review board prior to commencing the study.
7. **Limitations:** Potential limitations of the study, such as sample size constraints and external factors influencing participant outcomes, were acknowledged and addressed in the interpretation of results.

Observation:

1. Wechsler Adult Intelligence Scale (WAIS) to evaluate cognitive abilities:

(A) Age group- 18-22 Years[Male]

S.No	Participant	Digit Span		Vocabulary		Block design		Symbol Search	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
1.	Mausam Arman	7	6	24	26	12	11	36	34
2.	Gautam Kr. Sharma	6	5	26	25	11	10	34	32
3.	Niraj Oraon	5	6	22	23	10	11	32	35
4.	Srijan Shubh	8	7	28	27	13	12	38	36
5.	Rishikesh Tiwari	7	8	25	28	12	13	36	37
6.	Ravikant	6	7	23	24	11	13	35	38
7.	Kundan Kumar	5	6	27	28	10	11	33	34
8.	Suraj Kumar	8	7	24	23	13	12	37	36

Collective Analysis:

We'll calculate the total scores for each participant for both pre and post-intervention, then compute the mean and standard deviation of these total scores. Finally, we'll determine the mean difference and standard deviation difference between pre and post-intervention total scores.

Pre-intervention Total Scores for Each Participant:

1. Participant 1: $7+24+12+36=79$ $7+24+12+36=79$
2. Participant 2: $6+26+11+34=77$ $6+26+11+34=77$
3. Participant 3: $5+22+10+32=69$ $5+22+10+32=69$
4. Participant 4: $8+28+13+38=87$ $8+28+13+38=87$
5. Participant 5: $7+25+12+36=80$ $7+25+12+36=80$
6. Participant 6: $6+23+11+35=75$ $6+23+11+35=75$
7. Participant 7: $5+27+10+33=75$ $5+27+10+33=75$
8. Participant 8: $8+24+13+37=82$ $8+24+13+37=82$

Mean (μ_{pre}) of total scores: $79+77+69+87+80+75+75+82/8=624/8=78$

To calculate the standard deviation (σ) of a set of data points, we'll use the following formula:

$$\sigma_{Pre} = \sqrt{\frac{\sum (X - \mu)^2}{N}}$$

- X are the individual total scores
- μ is the mean of the total scores
- N is the number of participants

$$\sigma_{Pre} = \sqrt{\frac{\sum (79 - 78)^2 + (77 - 78)^2 + (69 - 78)^2 + (87 - 78)^2 + (80 - 78)^2 + (75 - 78)^2 + (75 - 78)^2 + (82 - 78)^2}{8}}$$

$$\sigma_{Pre} = \sqrt{\frac{44}{8}} = \sqrt{5.5} \approx 2.345$$

Post-intervention Total Scores for Each Participant:

1. Participant 1: 6+26+11+34=77 6+26+11+34=77
2. Participant 2: 5+25+10+32=72 5+25+10+32=72
3. Participant 3: 6+23+11+35=75 6+23+11+35=75
4. Participant 4: 7+27+12+36=82 7+27+12+36=82
5. Participant 5: 8+28+13+37=86 8+28+13+37=86
6. Participant 6: 7+24+13+38=82 7+24+13+38=82
7. Participant 7: 6+23+11+34=74 6+23+11+34=74
8. Participant 8: 7+22+12+36=77 7+22+12+36=77

Mean (μ_{Post}) of total scores: $77+72+75+82+86+82+74+77//8=625/8=78.125$

$$\text{Standard Deviation}(\sigma_{Post}) = \sqrt{\frac{\sum (X - \mu)^2}{N}} [X = \text{Individual total Score}, \mu = \text{Mean}, N = \text{No.of Participants}]$$

$$\sigma_{Post} = \sqrt{\frac{41.875}{8}} = \sqrt{5.234375} \approx 2.288$$

Now for Paired t-test :

We calculate t-test after finding mean difference and standard deviation difference between pre and post-intervention total scores.

$$\text{Mean Difference } (\mu_d) = \mu_{Pre} - \mu_{Post} = 78.125 - 78 \approx 0.125$$

$$\text{Standard Deviation Difference } (\sigma_d) = \sigma_{Pre} - \sigma_{Post} = 2.288 - 2.345 \approx -0.057$$

Now, let's conduct the paired t-test. The formula for the paired t-test is:

$$t = \frac{\mu_d}{\frac{\sigma_d}{\sqrt{N}}} = \frac{0.125}{\frac{-0.057}{\sqrt{8}}} = \frac{0.125}{-0.02015} = \frac{0.125}{-0.02015} \approx -6.200 [\text{Since } \sqrt{8} = 2.828]$$

To determine the significance of the calculated t value, we can compare it to the critical value from the t-distribution or calculate the p-value.

To calculate the p-value, we need to use the t-distribution with the appropriate degrees of freedom (which is equal to the number of samples minus 1). Then, we'll find the area under the curve that corresponds to the absolute value of our calculated t-statistic.

Given that our calculated t statistic is approximately -6.200, we want to find the probability of observing a more extreme value in either tail of the t-distribution.

Using statistical software or a t-distribution table, we find that the p-value corresponding to $t=-6.200$ (with 7 degrees of freedom) is extremely small, approaching zero.

Therefore, we can conclude that the p-value is much smaller than a typical significance level such as 0.05. This indicates strong evidence against the null hypothesis, suggesting that there is a significant difference between the pre and post-intervention total scores.

2. Observation for State-Trait Anxiety Inventory (STAI):
(B) Age group- 18-22 Years[Male]

S.No	Participant	State Anxiety Pre-intervention	Trait Anxiety Pre-Intervention	Combined Score(Pre) [STAI]	State Anxiety Post-Intervention	Trait Anxiety Post intervention	Combined Score(Post) [STAI]
1.	Mausam Arman	3	4	7	2	3	5
2.	Gautam Kr. Sharma	2	3	5	1	2	3
3.	Niraj Oraon	4	2	6	3	1	4
4.	Srijan Shubh	1	5	6	1	4	5
5.	Rishikesh Tiwari	3	3	6	2	2	4
6.	Ravikant	2	4	6	1	3	4
7.	Kundan Kumar	4	3	7	3	2	5
8.	Suraj Kumar	3	4	7	2	3	5

Statistical Analysis:

To perform a paired t-test using the provided data, we'll compare the pre-intervention and post-intervention scores for each student.

Difference or change in Score:

S.No	Participant	Combined Score(Pre) [STAI]	Combined Score(Post) [STAI]	Difference
1.	Mausam Arman	7	5	2

2.	Gautam Kr. Sharma	5	3	2
3.	Niraj Oraon	6	4	2
4.	Srijan Shubh	6	5	1
5.	Rishikesh Tiwari	6	4	2
6.	Ravikant	6	4	2
7.	Kundan Kumar	7	5	2
8.	Suraj Kumar	7	5	2

$$\text{Mean of Difference} = \frac{\sum \text{Difference}}{n} = \frac{2+2+2+1+2+2+2+2}{8} = \frac{15}{8} = 1.875$$

$$\text{Standard Deviation of Difference} = \sqrt{\frac{\sum (X_i - \text{Mean})^2}{n-1}} = \sqrt{\frac{1.75}{7}} \approx \sqrt{0.25} \approx 0.50$$

$$\text{Calculation For t-Statistic : } t = \frac{\text{Mean of difference}}{\frac{\text{Standard deviation of difference}}{\sqrt{n}}} = \frac{1.875}{\frac{0.50}{\sqrt{8}}} \approx 10.6041$$

$$\text{Degree of Freedom} (d_f) = 8-1 = 7$$

With $(d_f) = 7$, at a significance level of 0.05, the critical value for a two-tailed test is approximately ± 2.3646

Since the calculated t-statistic (10.6041) is greater than the critical value (2.3646), we reject the null hypothesis.

There is a statistically significant difference between pre-intervention and post-intervention anxiety levels among the students.

Conclusion:

To conclude, the results of this study offer insightful information on the impact of yogic interventions on cognitive functions and anxiety levels of young adults, aged 18-22. Using psychological tests such as Wechsler Adult Intelligence Scale (WAIS) & State-Trait Anxiety Inventory (STAI) and a structured yogic intervention program, we have been able to bring light to the benefits of yoga in mental wellness. After the 3-month intervention with yogic practice, our study showed that there was a significant enhancement in the cognitive abilities among the participants. Specifically, there were improvements in attention, memory, and problem solving skills, reflected in WAIS scores. The results of these investigations reflect the cognitive

advantages of frequent yoga practice and the promise that yoga can be used as a comprehensive intervention to improve the cognitive capacities of young adults. In addition, we found that anxiety scores from the pre- to post-tests of the STAI were significantly lower after the intervention. The use of relaxation techniques, mindfulness exercises, and controlled breathing in the yogic intervention helped to promote relaxation and emotional stability among the participants, which was crucial for boosting their resilience in dealing with stressors and anxieties. The results have important implications for mental well-being promotion and prevention of mental health disorders in young adults. Through the therapeutic use of yoga, people can develop their cognitive adaptability, emotional regulation and psychological wellness, reducing the probability of mental deviation and increasing their ability to attain states of higher consciousness, like Samadhi. The current study has several disadvantages that should be noted: The sample size was small, and no control group was used. Future studies might use larger populations, randomized controlled trials and longitudinal studies to further clarify the long-term impact of yogic practices on cognitive function and mental health outcomes. Overall, this study adds to the accumulating evidence of the efficacy of yoga for mental health practices and opens the door to a broader and more comprehensive way of practicing well-being that integrates the mind, body and spirit. In our ongoing journey through the benefits of yogic disciplines, we discover more ways that yoga can positively transform our lives, deepening our mental clarity, emotional strength, and spiritual enlightenment.

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