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Effect of Super Brain Yoga on Cognitive Functions among School Children: A Study Protocol on Randomized Controlled Trial

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ABSTRACT

Background: School children face a lot of stress due to poor academic performance. Long-term low academic performance in primary and secondary schools may even lead to depression in teenage years. The assessment of cognitive functions may help in the evaluation of students' functional capacity. Super Brain Yoga (SBY) is one of the yogic technique in ancient practice used improve their learning.
Methodology: In this research, we are adopting randomized controlled trial with a sample size of 100. Subjects will be recruited from a private school, Chengalpattu. Subjects will be divided into 2 two groups namely, intervention and control group with 50 subjects in each group. Intervention group subjects will be practising 3 sets (1 set is 18 counts) of SBY for 6 weeks. Pre and post assessment will be done. Reaction Time (RT) and Critical Flicker Fusion Frequency (CFFF) will be used to assess the cognitive functions.
Results: Pre and post data will be analysed using 'R' statistical software. Data will be presented in bar diagram using mean value. In this study p value < 0.05 will be considered as statistically significant.
Conclusion: If this present study shows significant changes in the cognitive functions, then SBY may be incorporated as regular practices among school children to improve academic performance and mental health.

Keywords: Yoga, Cognitive function, School Children, Mental Health, Learning and Performance.

INTRODUCTION

School children face a lot of stress due to poor academic performance. Long-term low academic performance in primary and secondary schools may even lead to depression in teenage years.[1] There are several factors can influence the academic performance, and cognitive ability is among the most important of these factors.[2,3] Cognitive ability is determined by cognitive functions, which are influenced by the speed of information processing, attention span, language skills, visual-spatial orientation and many others.[4] Improvement in cognitive functions may also have positive impact on academic performance.[5] The

assessment of cognitive functions may help in the evaluation of students' functional capacity.[6] There are many tools for the assessment of cognitive functions, out of which Reaction Time (RT) and Critical Flicker Fusion Frequency (CFFF) are two of the commonly used tests for the assessment of certain cognitive functions that are involved in learning and performance.[7] RT and CFFF have also been documented as markers of a higher cognitive function.[8,9] They are commonly used in clinical settings because they are simple, reliable, valid and cheap.[10]

There are studies showing that regular practice of mind-body therapy called yoga practices can improve the physical and mental health. (11) Earlier studies conducted on school children, concluded that yoga can improve their academic performance.[7]

Super Brain Yoga (SBY) is one of the yogic technique in ancient practice, where the practitioners have to hold the opposite side of the hear lobes and squat as much as possible for several times. Studies show that SBY can enhance cognition and psychological well-being.[9] After strenuous literature search, we found that there was no study done on super brain yoga on cognitive functions among school children. Hence, the present study was planned to evaluate the impact of a six-week practice of Super Brain Yoga on cognitive functions among school children.

MATERIALS & METHODS

Study Setting:

The present study will be a randomized controlled trial, on students from the private school, Chengalpattu, Tamilnadu. The study is planned to start from August 2024 and completed by November 2024. Institutional Ethical Committee (IEC) approval from the institutes has been taken, vide letter numbers Ref N0.446/ME-II/2023. The Clinical Trial registration: CTRI/2023/10/074792.

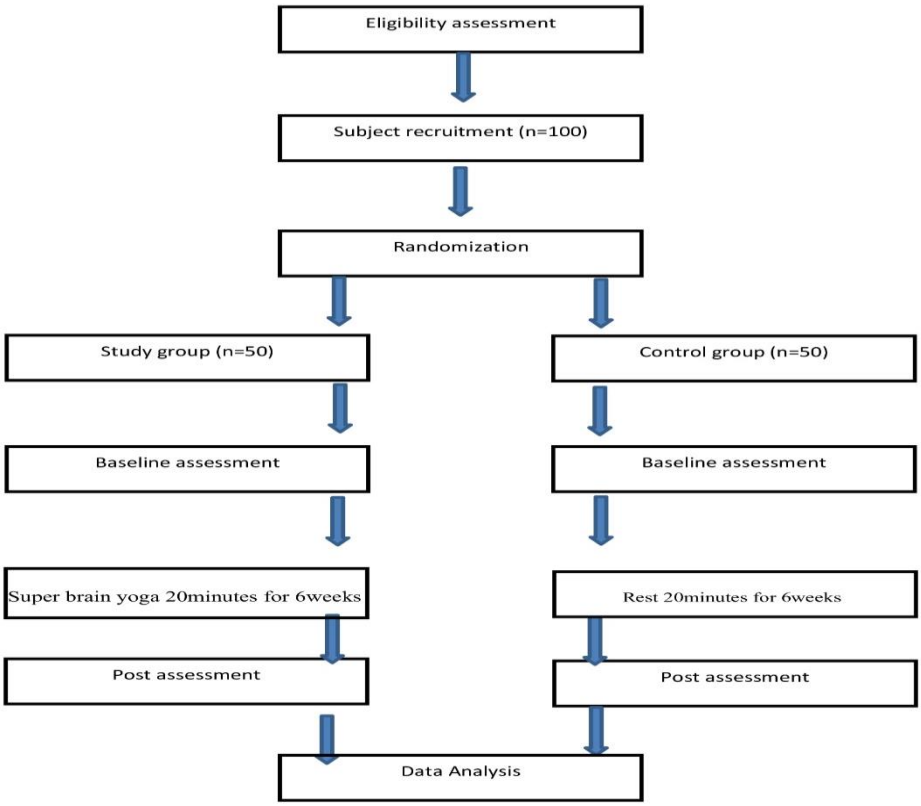

Figure 1: Trial Profile

Sample size:
The sample size calculation will be based on a similar study that was conducted on 100 samples. With 80% power, two-tailed significance, an expected drop-out rate of 20%, and a 1:1 allocation, a total sample of 100 participants is estimated.[12]

Randomization and blinding:
All the subjects will be randomly allocated to either a subject or a control group (1:1 ratio) using computerized randomization. The participants will not be blinded to the study and control group.

Selection of Participants:
Inclusion criteria:
Healthy children both boys and girls, aged between 12–16 years with no history of any illness for at least six months before the study.
Exclusion criteria:
Unwilling subjects and the those who could not comprehend and follow the instructions given by the instructor. Subjects who are on under medication will be excluded.

Intervention group:
Super Brain Yoga will be practiced for three rounds a day. Each round contains 18 repetitions. There will be five minutes of relaxation between each round.

Intervention Procedure:
Stand straight with legs shoulder width apart. Hold the right ear lobe using left thumb and index finger and left ear lobe using right thumb and index finger. Subjects has to do conscious exhalation while squat and inhalation while coming back to straight position. Repeat this practice for 3 rounds (1 round is 18 times) with 5 minutes of relaxation in between each round.[13]

Control group:
There will be no intervention in control group. They will be asked to resting position for 20 mins a day for 6 weeks.

Outcome measures:
Cognitive Function will be assessing before and after intervention with Critical flicker frequency and visual and auditory reaction time.

Assessment:
Critical flicker frequency (CFF)
The frequency at which flickering light can be perceived as continuous and it is used to assess the processing of temporal vision.[14]

Visual and auditory reaction time (RT)
The auditory stimulus reaches the cortex faster than the visual stimulus. Reaction time is good indicator of quickness in physical activity, sensorimotor coordination and performance of an individuals.[14]

STATISTICAL ANALYSIS
Statistical analysis will be done using 'R' Software.

RESULT
Result of this study will be presented in the tabular column and bar diagram.

DISCUSSION
The current study is the first study to explore the effect of Super brain yoga practice on cognitive functions in school children. Previous literature suggests that yoga improves cognitive functions.[15] Schools can implement SBY to improve the academic performance of students.[16] Watson observed increase in Alpha waves had a long-term improvement of memory functioning, speed of information processing, perceptiveness and decision-making ability and problem-solving.[11] We hypothesis that, this present study may have change in the short-term memory and selective attention of students which may be due to the increase in the alpha wave activity in the brain.

CONCLUSION
If this present study shows significant changes in the cognitive functions, then SBY may be incorporated as regular

practices among school children to improve academic performance and mental health.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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