

## Beneficial effects of Superbrain *yoga* on short-term memory and selective attention of students

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Superbrain *Yoga* is a simple squatting technique that uses subtle energy to improve cognitive functioning of individuals. The present study aims to find the effectiveness of superbrain *yoga* on short-term memory and selective attention of students. Pre test-post test design was used in the study. The study was conducted on 91 students from a residential school in Mysore district with a mean age of 11.9 years. The Knox cube test was used to evaluate the short-term memory, and digit cancellation test was administered to assess the selective attention of students. Pre-scores and post-scores were recorded, and energy enhancement was measured before and after Superbrain *Yoga* practice. Scores were analysed using repeated measure ANOVA and chi-square test. A mean gain of 1.18 in score with significance ( $F = 1.884, p < .001$ ) in short-term memory and a mean gain of 3.31 with significance ( $F = 4.426, p < .001$ ) in selective attention after one month of Superbrain *Yoga* was observed. In between pre- and post-session an increase of, 34.27 % in left hemisphere and 28.71 % in right hemisphere was measured in *pranic* energy levels. Superbrain *Yoga* has been found to be effective in improving short term memory and selective attention among students.

**Keywords:** Superbrain *Yoga*, Short-term memory, Selective attention, *Pranic* energy.

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The human brain is a powerful and sophisticated organ. It becomes necessary to maximise its potential for better work output and holistic wellbeing. Constant research has been undertaken in this area for the same reason. Superbrain *Yoga* (SBY) is initiated by squeezing ear acupuncture points by fingers with hands placed across the chest and involves 14 squats with recommended breathing<sup>1</sup>. SBY rebalances the energy level in the body for optimal functioning of the brain. The Superbrain squat transforms and transmutes the energy that is trapped in the lower *chakra* to the upper *chakras*. *Chakras* or whirling energy centres absorb, digest and distribute *prana* to the different parts of the body and are responsible for the proper functioning of the human<sup>2</sup>. The simple technique of SBY can be beneficial for students and adults. SBY also benefits adolescents by regulating their sex drive and provides psychological stability<sup>1</sup>. Further, to explain the principle behind squeezing of ear in Superbrain *yoga*, various theories have been put forward. Nogier first presented his observations of the

somato topic correspondences of the ear by showing that groups of pluripotent cells in the ear contain information of the whole organism<sup>3</sup>. Thus, stimulation of a reflex point in the ear can relieve symptoms of distant pathology within a reliable duration<sup>4</sup>. SBY could also be looked at from the point of it being a form of physical exercise. Research has found that there is a positive effect of any physical activity in improving attention and enhancement of cognitive performance and brain function<sup>5</sup>. Studies also indicate that coordinated exercise increases one's attention<sup>6</sup>.

When the brain waves are in an Alpha state, we are usually at best at what we do. Alpha state is where the person is more relaxed and calm at the same time more alert. If children learn to stay calm under stress, they are less likely to be engaged in problematic behaviours<sup>7</sup>. When one is calm and alert, the prefrontal lobes are free to engage in higher level thinking tasks which help a child to pay attention, concentrate, solve problems, be creative, learn and remember<sup>8</sup>. In a study, it was observed that Alpha wave activity among students increases after practicing SBY for thirty days<sup>9</sup>.

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Regular practice of SBY for a month had improved anxiety management among adolescents<sup>10</sup>.

**Short-term memory:** Short-term memory represents the brain's ability to hold and process discrete information about what you are doing at the present moment. Short-term memory is used in processing information, which involves sequential ability and activates the prefrontal and parietal cortex in the brain. Short-term memory is crucial in the classroom. Studies show that learning, reasoning, organising priorities, managing time, staying focussed and handling stress are all dependent on a healthy short-term memory capacity<sup>11,12</sup>.

**Selective attention:** Selective attention is the process of focusing on a particular object in the environment for a certain period of time. Attention is a limited resource, so selective attention allows us to tune out unimportant details and focus on what really matters. The ability to focus on the task at hand and ignore distractions appears to have deep effects on various domains that are important in academic foundations, including language, literacy and mathematics<sup>13</sup>.

In the present times, the short-term memory of children has become limited due to constant multi-tasking, excessive usage of phones and other electronic devices. Recent studies have shown that this kind of multitasking reduces the efficiency and performance because the brain can only focus on one thing at a time<sup>14,15</sup>. Enhancing selective attention is important for filtering out wanted from unwanted stimulus. This can also go a long way in improving their academics and mental health. In the Indian context, the rural population may not have access to specialised therapy approaches and software for treating selective attention deficiency, that are available in the urban area. SBY would be an easy and inexpensive technique, which once learnt could be practiced all through one's life. Regular practice of SBY has been known to enhance individuals' cognitive performance<sup>9,10</sup>. The present study aims to find the effect of SBY on the short-term memory and selective attention of students.

## Methods

### Research design

A quantitative framework was adopted in the study. A pre-test-post-test design was used where the dependent variable was measured once in the pre-test period, that is prior to the intervention or exposure and

the post-test period, which is after the exposure. The present study compared the short-term memory and selective attention of students before the implementation of SBY and they have been assessed after the implementation of SBY. Experiences during and after practice of SBY were recorded. The energy enhancement after practicing SBY was further explored.

### Operational definition

**Short-term memory:** In the Knox cube test, short term memory span is measured by the extent of correct sequence of tapping the blocks by the participant. A higher score on the test can be considered as a better short term memory span for the participant<sup>16</sup>.

**Selective attention:** On the digit cancellation test, selective attention is measured by the number of correct specified digits that have been cancelled by the participant. A higher score on the test can be indicative of a better selective attention for the participant<sup>17</sup>.

### Sample

The participants chosen for this present study were 91 students between ages of 10 and 12 yrs, who were selected using random sampling technique, of which 58 were males and 33 were females. The sample was chosen based on the inclusion and exclusion criteria.

**Inclusion criteria:** Age group of 10 to 12 yrs and those interested in practicing SBY.

**Exclusion criteria:** Those who were previously exposed to SBY and those having any psychological ailments.

### Tools

**Socio-demographic data:** This was developed to document participants' basic information such as name, gender, age and level of education.

**Knox cube test:** The cube imitation test was developed by Knox as a nonverbal test of intelligence<sup>16</sup>, is considered as a highly standardised test and has been used in many international studies. It is also used as a measure of the short-term memory of individuals above the age of 5 yrs.

**Digit cancellation test:** The digit cancellation test has been used to measure selective attention of an individual. The present study administered digit cancellation test using three trials and then averaging the score of the three trials. The desired response is obtained by scanning the arrays of digits and crossing out the notified digits. The performance of an individual depends on his/her vigilance, arousal, and motivation<sup>17</sup>.

**Open-ended questionnaire:** An open-ended questionnaire was used to document the experiences of the students during and after the practice of SBY.

**Ruler:** A ruler was used to measure the differences in energy around the head before and after the practice of SBY. The energy level was first measured using the scale before the introduction of SBY to the experimental group. Later, the energy differences were measured after introduction of SBY in the first session, and then finally after one month practice. The length of energy difference was expressed in terms of centimetre.

#### Procedure

On receipt of permission from the authorities from a Government Residential school located in Mysuru district, students were short listed based on the inclusion and exclusion criteria. Students were then sensitised and trained to experience and feel *prana*—the vital energy as introduced by Master Sui. Short term memory and selective attention data along with energy levels in left and right hemispheres of brain from the students were measured before introduction of SBY. Students were introduced and guided with SBY practice. After the first practice, the *Pranic* energy levels of left and right hemispheres of brain were measured and their experiences recorded using an open-ended questionnaire. Students were instructed to practice SBY every morning by doing 14 squats consecutively before they left for school. Weekly visits were paid by the investigators to mentor students about the practice and to guide them if necessary. After one month of regular SBY practice, the post test data was collected by running

the test again, and the scores were recorded. The energy in the left hemisphere and right hemisphere of the brain was measured using a scale, to see if there is an increase or decrease in the energy levels. The obtained data was recorded using Microsoft Excel software and statistically analysed using repeated measure ANOVA and chi-square test.

#### Results and discussion

Students' scores and responses were consolidated, statistically analysed and interpreted. The results show there is a significant improvement in short-term memory from pre-test to post-test for the entire sample ( $F = 1.884, p < .001$ ). There was also a significant improvement in selective attention from pre-test to post-test ( $F = 4.426, p < .001$ ). However, there was no differential gain in the short-term memory ( $F = 2.346, p = .179$ ), selective attention ( $F = 1.845, p = .245$ ) based on gender of the student from pre-test to post-test for the entire study (Table 1).

Table 2 shows a significant difference in terms of change in length of the *Pranic* energy levels in left and right hemispheres of the brain before and after practice of SBY. There was a slight change from pre-session to post first session in both left and right hemispheres. However, there was a significantly large improvement in the energy levels between the pre-session and the post final session, readings of which were taken after a month of practice. The left hemisphere had a significant increase, of 34.27 % mean in *Pranic* energy level ( $F = 24.714, p < .001$ ). Right hemisphere had a significant increase, of 28.71 % mean in *Pranic* energy level ( $F = 25.325, p < .001$ ).

Table 1 — Repeated measure ANOVA for short-term memory and selective attention

Variable	Gender	Session				Gain	Test statistics
		Pre-test		Post-test			
		Mean	SD	Mean	SD		
Short term memory	Male	6.50	1.98	7.62	2.04	1.12	(Gender $F=2.346, p=.179$ )
	Female	6.20	2.27	7.48	1.84	1.28	
	Total	6.47	1.708	7.65	1.66	1.18	
Selective attention	Male	25.95	1.98	28.76	2.04	2.81	(Gender $F=1.845, p=.245$ )
	Female	24.95	2.27	28.49	1.84	3.54	
	Total	25.5	5.917	28.81	6.378	3.31	

Table 2 — Enhancement of energy levels before and after practicing super brain yoga

	Session	Mean	SD	Gain	Test statistics
Left hemisphere	Pre-session	11.260	4.769	3.859	(F=24.714, p<.001)
	Post first session	12.465	5.124		
	Post final session	15.119	5.076		
Right hemisphere	Pre-session	11.846	4.626	3.401	(F=25.325, p<.001)
	Post first session	11.939	5.758		
	Post final session	15.247	5.957		

Table 3 — Students expressions after practicing super brain yoga for one month

Other improvements experienced by students		Total	Chi square	Sig
Improved smartness	f	32	$\chi^2 = 8.011$	p=.005
	%	35.20		
Fast reading	f	17	$\chi^2 = 35.703$	p<.001
	%	18.70		
Improvement in writing	f	15	$\chi^2 = 40.890$	p<.001
	%	16.50		
Increased brain power	f	20	$\chi^2 = 28.582$	p<.001
	%	22.0		

On the domain of cognitive skills, improved smartness ( $\chi^2 = 8.011$ ,  $p < .005$ ), increased brain power ( $\chi^2 = 28.582$ ,  $p < .001$ ), improvement in fast reading ( $\chi^2 = 35.703$ ,  $p < .001$ ) and improvement in writing skills ( $\chi^2 = 40.890$ ,  $p < .001$ ) were significantly expressed by the participants (Table 3).

The results revealed that there was a significant improvement in the short-term memory and selective attention of students after SBY practice. Any physical activity has a positive effect in improving attention and enhancement of cognitive performance and brain function<sup>4</sup>. SBY in particular may facilitate this process. Superbrain squat when done properly moves energy trapped in the basic and sex *chakras* through the physical body's other major energy centres and finally up into the crown *chakra*. SBY increases alpha wave activity immediately after performing SBY<sup>9</sup>. 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<sup>18</sup>. The present study shows that there was a significant 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. In the current study, there was no differential gain in short-term memory and selective attention after implementation of SBY, based on gender of the student. The effect of SBY has been uniform among both male and female students. This is supported by previous study, where there was no significant difference in the effectiveness of SBY on the psychological wellbeing of students, based on gender. This may be explained by the fact that SBY mainly deals with the transmission of energy from lower *chakras* to the higher *chakras*, and this transmission is not affected by the gender in any way<sup>19</sup>.

Present study showed significant enhancement of energy in both right and left hemispheres of the brain after practising SBY. Students were introduced to feel

and measure the energy in the left and right hemisphere of brain. Students have reported various sensations such as warmness, coolness feeling at fingertips, and repulsiveness which are experiences of *prana*. About 90 % of students feel a tingling sensation, heat, pressure or rhythmic pulsation between the palms on the first try<sup>20</sup>. Numerous healers report palpable sensations when they move their hands close to but not touching the body<sup>21</sup>. There can be a decreased skin temperatures from the "emitting" palm of Qigong masters during external qi emission<sup>22</sup>. In the present study, enhancement of energy in the participants after practice of SBY has resulted in the participants benefiting psychologically. SBY provides the energy fuel that keeps the brain fit and functional and helps to counter common effects of aging, memory loss, dementia and Alzheimer's disease<sup>1</sup>. Adolescents showed enhanced mental activity<sup>9</sup> and reduced academic anxiety levels<sup>10</sup> after regular practice of SBY for a month. In a study on anxiety and mindful attention using similar squatting technique like SBY called *Thoppukarnam* revealed that there was a significant improvement in all measures of the d2 test of attention and state mindfulness. The study also showed that anxiety reduced significantly after the experimental session, with enhancement of cognitive functioning and psychological states<sup>23</sup>. Genovese & Little<sup>24</sup> obtained no significant difference on academic performance of adults practicing SBY. This could probably be due to post test done immediately after practicing SBY.

### Conclusion

This study indicates that SBY improves the short-term memory and selective attention of the students. This could be very beneficial for students since it could help them in academic related and learning processes. The present study also documented the enhancement of energy after practice of SBY for a month, thereby showing benefit for regular practitioners. The various experiences reported by students on the physical, psychological and bioplasmic domains can be used as an anchoring point for further research. SBY could be considered as an adjunctive therapy for application to improve the overall cognitive functioning of students. It can be applied to students who have been given secondary diagnosis due to academic related difficulties. The present findings could be applied at schools particularly. Schools can use this simple technique every day to improve the cognitive functioning of the students and to help students with academics and performance.

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