

Yoga improves attention and self-esteem in underprivileged girl student

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ABSTRACT

Background: A student under optimal stress does bring out his or her best; however, extreme stress can result in mental health problems and deteriorates their academic performance. Students who esteem themselves low are most likely to engage in destructive and self-destructive behaviors. Moreover, excessive stress is harmful to academic performance and may lead to dropping out in student. Can Yoga be of benefit in students for improving their attention and self-esteem (SE)? **Objective:** To assess attention and SE in girls undergoing Integrated Yoga Module (IYM). **Materials and Methods:** Sixty low-income high school girls with 15.17 ± 0.64 years of mean age participated in this single group pre-post study. The data was collected before and after 5 days of IYM. **Statistical Analysis:** Means, standard deviations, Kolmogorov-Smirnov test, and Wilcoxon signed rank test were used to analyze the data with the help of SPSS 16. **Results:** The data analysis showed 9.04% increase ($P = 0.001$) in SE scores, whereas d2 test for attention revealed 10.12% increase ($P < 0.001$) in total number of symbols processed scores and 44.73% decrease ($P < 0.001$) in total number of errors. **Conclusion:** The present study suggests that of IYM can result in improvement of attention and SE among students and thereby enhancing their mental health and can help them in improving their academic achievement. Efforts aimed at reducing mental health problems among students may focus more on implementing effective and culturally acceptable interventions, such as Yoga, counseling, and social support. Additional well-designed studies are needed before a strong recommendation can be made.

Key words: Attention, girl students, integrated yoga module, mental health, self-esteem

INTRODUCTION

Attention is an essential element of cognition and has been characterized in two ways, that is, either as a resource or

capacity or as a skill of resource deployment. Attention is the capacity to attend to a task in hand for a required period of time.^[1] The capacities to study and listen to a lecture for an extended length of time are examples of sustained attention.^[2]

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The self-regulation method derived from autogenic training and Zen meditation, which elicits a state of 'relaxed alertness,' also, increases attention span.^[3] Meditation increases attention span.^[4] Ancient Yogic texts suggest that a combination of both "calming" and "stimulating" yogic practices helps in increasing the span of attention.^[5] The effects of Yoga on cognitive functions have shown improvement in memory and attention.^[6] Cognitive reactions of stress result in an inability to concentrate.^[7] It was reported that transcendental meditation reduces stress^[8] and improves attention resulting in enhanced academic performance.^[9] Yogic practices like asana, pranayama, vedic chanting, and meditation enhances

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attention, self-esteem (SE)^[10] and improves visual and spatial memory.^[11] Tower of London test done on girl students practicing Yoga showed improvement in attention.^[12]

Mendelson *et al.* in their study on mindfulness approaches have shown that students in underserved urban communities are at risk for a range of negative outcomes related to stress, including social-emotional difficulties, behavior problems, and poor academic performance.^[13] Yoga may improve adjustment among chronically stressed and disadvantaged students by enhancing SE. Stress has an implication for low SE in students, and it was reported that regular practice of Yoga by medical students for a longer period may possibly result in improved management of their daily stress.^[14] Several studies have been published analyzing the effect of different aspects of Yoga including cleansing techniques, physical postures, breathing practices, relaxation techniques and meditation on attention, and SE.^[15-20] However, the changes that actual happens in attention and SE performance of the high school girls, especially belonging to the low-income segment of the society undergoing Integrated Yoga Module (IYM), has not been reported adequately so far. Hence, the present study has been designed to assess the efficacy of IYM on attention and SE in low-income high school girls.

Objectives

This study is to assess improvement in attention and SE in low-income high school girls undergoing IYM.

MATERIALS AND METHODS

Subjects

Sixty low-income high school girls in the age range of 14 to 17 years from underprivileged and lower income sections of urban community were selected for the study based on the following inclusion and exclusion criteria [Table 1].

Inclusion criteria

- School girls in the age range of 14 to 17 years
- School girls from underprivileged and lower income sections of urban community.

Exclusion criteria

- Girls with neurological or psychological disturbances
- Girls with learning disabilities and cognitive deficits
- Girls under medication for health problem

Design

A single group pre-post study

PRE→POST→5 DAYS OF IYM

Source

Maharani Girl's High School, Mysore, India.

Informed consent

An informed consent from the school head was obtained on the behalf of the students, as their acting guardian. The study

was approved by the Institutional Review Board of S-VYASA University.

Intervention

All the students participated in the IYM for 5 days. The module was selected from Integrated Approach of Yoga Therapy (LAYT) for positive health.^[10,12,20] IYM was chosen to bring about an all-round development at physical, mental, emotional, social, and spiritual level. Yoga Practices helps to increase relaxation and balance the mind, body, and the spirit. Yoga in its full form combines physical postures, breathing exercises, meditation, and a distinct philosophy. This way, yoga can enhance attention and SE faculties in students and helping them to obtain academic excellence [Table 2].

Assessments

The Rosenberg Self-esteem (RSE) scale is widely used for SE measurement developed by Rosenberg in 1965.^[21] The scale measures SE, which is a positive evaluation of one's attributes and sense of self-worthiness. It consists of 10 items on Likert scale. Participants indicate their agreement-disagreement level for each item along a four-point scale, ranging from "strongly agree" to "strongly disagree." The maximum possible score is 40, and the minimum is 10. Higher scores in the scale indicate higher self-esteem. The scores below 15 suggest low esteem of the children. Multiple studies have been conducted to investigate the validity and reliability of the RSE scale, whereas some studies have shown that the scale is a valid and reliable one-dimensional measure of self-esteem. In summary, it appears that the internal reliability and factor structure of the RSE is psychometrically sound across many languages and cultures of different nations.^[22]

The d2 test is a cancellation test of attention and concentration. The test measures processing speed, rule compliance, and quality of performance, allowing estimation of individual attention and concentration performance.

Table 1: Detail of subjects

Age (In years)	14	15	16	17	Total
No. of girls	7	37	15	1	60
Mean±SD	15.17±0.64				

Table 2: Schedule of IYT practice for 3 hours

Time	Activity
10.00 AM	Prarthana (Prayer), Lectures on Karma Yoga (The path of selfless action), Bhakti Yoga (The path of emotions), Jnana Yoga (The path of intellect) and Raja yoga (The path of will power)
11.00 AM	Surya Namaskara (Practice of sun salutation), Asanas (Postures) Standing, Sitting, Prone and Supine Postures
12.00 PM	Pranayama (Breathing techniques) – Kapalabhati (Cleansing technique), Nadishuddhi (Practice of balancing of breath), Bhamari (Resonance producing breath) Krida Yoga (Games with awareness), Dhyana (Meditation)
01.00 PM	Lunch

IYT: Integrated yoga module

The test items consist of the letters *d* and *P* with one to four dashes, arranged either individually or in pairs above and below the letter. The subject must scan across each line to identify and cross out each *d* with two dashes. In the manual, these items (correct hits) are called “relevant items.” All other combinations of letters and lines are considered “irrelevant,” because they should not be crossed out. The one-page *d2* test form consists of 14 lines, each with 47 characters, for a total of 658 items. The subject is allowed 20 seconds per line. The internal consistency and convergent and discriminates validity of the *d2* test, a cancellation test of attention and concentration, has been examined on adolescent and adult through many studies to establish its reliability and validity. Results suggested that the *d2* test is an internally consistent and valid measure of visual scanning accuracy and speed.^[23]

Data collection

The *d2* test of attention and SE data was collected before (pre) and after (post) the 5 days of IYM by a person not connected with intervention and guided by a psychologist. The group was first given the RSE, after which *d2* test of attention questionnaire was given for filling. The *d2* tests of attention and SE data were collected systematically, and scoring of the questionnaires was carried out as per the instructions given in the manuals.

Analysis

Statistical analysis was done with the help of Statistical Package for Social Sciences [SPSS]-16. The baseline data were tested using Kolmogorov- Smirnov test, which showed that the data were not normally distributed. Hence, Wilcoxon ranked sign test was used.

RESULTS

The results showed that all the variables of *d2* test of attention and SE were significantly increased when the post score was compared against the pre score. SE found not normally distributed ($P < 0.05$). Hence, we have run Wilcoxon sign rank test to compare pre versus post score of SE. There were significant increases in SE (9.04%, $P < 0.01$) [Tables 3 and 4].

DISCUSSION

Physical activity is an essential part of a healthy lifestyle in adolescence. Results of earlier study had shown that SE correlated with bodily pain, and its improvement was correlated with mental health and depression ($P < 0.05$).^[24] Previous report on SE revealed that damaged SE was associated with depressive symptoms, suicidal ideation, and loneliness.^[25] It was reported that physical activity to be associated with socio-economic status and SE. Adolescents with higher socio-economic status were significantly more likely to report physical activity on ≥ 5 days/week and to report higher SE. In logistic regression, the association between socio-economic status and physical activity decreased after including SE, suggesting that at least a part of this association is mediated by SE.^[26] Earlier studies also indicate that, in general, those with

Table 3: Results of SE scores

N	Mean \pm SD		Percentage increase	P
	Before IYT	After IYT		
60	16.22 \pm 2.66	17.68 \pm 2.16	9.04	<0.001*

SE: Self-esteem, IYT: Integrated yoga module

Table 4: Results of *d2* test of attention

<i>d2</i> scales	Mean \pm SD		P
	Before	After	
TN	591.98 \pm 50.80	651.88 \pm 7.49	<0.001*
E2	4.50 \pm 9.54	16.22 \pm 13.88	<0.001*
E_errors	155.37 \pm 27.62	85.87 \pm 43.63	<0.001*
TN_E	437.72 \pm 45.52	567.67 \pm 44.30	<0.001*
CP	114.07 \pm 25.45	211.78 \pm 46.53	<0.001*
FR	8.13 \pm 2.78	3.07 \pm 0.52	<0.001*
TNSC	123.00 \pm 7.62	130.08 \pm 1.14	<0.001*

*Significant at $P < 0.001$ on Wilcoxon's sign rank test, *d2*: The *d2* test of attention

higher socio-economic status report higher SE than those with lower socio-economic status.^[27] Students participating in Yoga reported fewer negative behaviors in response to stress and had better balance than a comparison group, suggesting improvements in well-being and positive behavior. Moreover, Yoga may also be used as a preventive intervention as well as a means of improving children's perceived well-being.^[28] The present study is consistent with these findings, indicating that a systematic adoption of an IYM can result in better attention and SE among students.

CONCLUSION

The IYM module is found to show significant improvement in the attention and SE in high girl students. The study confirms that even short-term Yoga intervention in the form of IYM improves the SE and enhances the attention abilities of the high school children, paving way for academic excellence. The study gives scope for a long-term study in future, for more consistent results; and at the same time, additional well-designed studies are needed before a strong recommendation can be made.

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REFERENCES

1. Posner MI. Chronometric explorations of mind. In: Hillsdale NJ, editor. UK: Lawrence Erlbaum Associates; 1978.
2. Rueckert L, Grafman J. Sustained attention deficits in patients with right frontal lesions. *Neuropsychologia* 1996;34:953-63.
3. Ikemi A, Tomita S, Kuroda M, Hayashida Y, Ikemi Y. Self-regulation method: Psychological, physiological and clinical considerations. An overview. *Psychother Psychosom* 1986;46:184-95.
4. Banquet JP, Bourzeix JC, Lesèvre N. Evoked potentials and vigilance states induced during the course of choice reaction time tests. *Rev Electroencephalogr Neurophysiol Clin* 1979;9:221-7.

5. Telles S, Reddy SK, Nagendra HR. Oxygen consumption and respiration following two yoga relaxation techniques. *Appl Psychophysiol Biofeedback* 2000;25:221-7.
6. Sharma VK, Das S, Mondal S, Goswami U, Gandhi A. Effect of Sahaj Yoga on neuro-cognitive functions in patients suffering from major depression. *Indian J Physiol Pharmacol* 2006;50:375-83.
7. Sailer HR, Schlacter J, Edwards MR. Stress: Causes, consequences, and coping strategies. *Personnel* 1982;59:35-48.
8. Michaels RR, Huber MJ, McCann DS. Evaluation of transcendental meditation as a method of reducing stress. *Science* 1976;192:1242-4.
9. Wallace RK, Mills PJ, Orme-Johnson DW, Dillbeck MC, Jacobe E. Modification of the paired H reflex through the transcendental meditation and TM-Sidhi program. *Exp Neurol* 1983;79:77-86.
10. Telles S, Hanumanthaiah B, Nagarathna R, Nagendra HR. Improvement in static motor performance following yogic training of school children. *Percept Mot Skills* 1993;76:1264-6.
11. Naveen KV, Nagarathna R, Nagendra HR, Telles S. Yoga breathing through a particular nostril increases spatial memory scores without lateralized effects. *Psychol Rep* 1997;81:555-61.
12. Manjunath NK, Telles S. Improved performance in the Tower of London test following yoga. *Indian J Physiol Pharmacol* 2001;45:351-4.
13. Mendelson T, Greenberg MT, Dariotis JK, Gould LF, Rhoades BL, Leaf PJ. Feasibility and preliminary outcomes of a school-based mindfulness intervention for urban youth. *J Abnorm Child Psychol* 2010;38:985-94.
14. Parshad O, Richards A, Asnani M. Impact of yoga on haemodynamic function in healthy medical students. *West Indian Med J* 2011;60:148-52.
15. Narasimhan L, Nagarathna R, Nagendra H. Effect of integrated yogic practices on positive and negative emotions in healthy adults. *Int J Yoga* 2011;4:13-9.
16. Vandana B, Saraswathy L, Pillai GK, Sunadaram KR, Kumar H. Meditation induces a positive response during stress events in young Indian adults. *Int J Yoga* 2011;4:64-70.
17. Ganpat TS, Nagendra HR. Yoga therapy for developing emotional intelligence in mid-life managers. *J Midlife Health* 2011;2:28-30.
18. Rani K, Tiwari S, Singh U, Agrawal G, Ghildiyal A, Srivastava N. Impact of Yoga Nidra on psychological general wellbeing in patients with menstrual irregularities: A randomized controlled trial. *Int J Yoga* 2011;4:20-5.
19. Deshpande S, Nagendra HR, Raghuram N. A randomized control trial of the effect of yoga on Gunas (personality) and Health in normal healthy volunteers. *Int J Yoga* 2008;1:2-10.
20. Deshpande S, Nagendra HR, Nagarathna R. A randomized control trial of the effect of yoga on Gunas (personality) and Self esteem in normal healthy volunteers. *Int J Yoga* 2009;2:13-21.
21. Rosenberg M. *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press; 1965.
22. Schmitt DP, Allik J. Simultaneous administration of the Rosenberg Self-Esteem Scale in 53 nations: Exploring the universal and culture-specific features of global self-esteem. *J Pers Soc Psychol* 2005;89:623-42.
23. Bates ME, Lemay EP Jr. The d2 Test of attention: Construct validity and extensions in scoring techniques. *J Int Neuropsychol Soc* 2004;10:392-400.
24. Bahaeloo-Horeh S, Assari S. Students experience self-esteem improvement during mountaineering. *Wilderness Environ Med* 2008;19:181-5.
25. Berger DL, Silver EJ, Stein RE. Effects of yoga on inner-city children's well-being: A pilot study. *Altern Ther Health Med* 2009;15:36-42.
26. Creemers DH, Scholte RH, Engels RC, Prinstein MJ, Wiers RW. Implicit and explicit self-esteem as concurrent predictors of suicidal ideation, depressive symptoms, and loneliness. *J Behav Ther Exp Psychiatry* 2012;43:638-46.
27. Veselska Z, Madarasova Geckova A, Reijneveld SA, van Dijk JP. Socio-economic status and physical activity among adolescents: The mediating role of self-esteem. *Public Health* 2011;125:763-8.
28. Veselska Z, Madarasova Geckova A, Gajdosova B, Orosova O, van Dijk JP, Reijneveld SA. Economic differences in self-esteem of adolescents influenced by personality, mental health and social support. *Eur J Public Health* 2010;20:647-52.

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