



**EFFECT OF SURYANAMASKAR YOGA NIDRA AND PRANAYAMA ON  
BODY MASS INDEX AND ANXIETY OF CHILDREN WITH  
ALEXITHYMIA**

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**ABSTRACT**

Pranayama on body mass index and anxiety of children with Alexithymia. Materials and Methods: 42 girl children with alexithymia disorder, aged from 8 to 12 were selected as subjects from the girls' hostel at Krishna district during the year 2021. The subjects were divided into experimental group and control group, consisting twenty one subjects in each group, namely experimental group and control group. The experimental group underwent Suryanamaskar, Yoga Nidra, and Pranayama practices for 5 days per week for 9 weeks. The control group was not given any training during the study. The selected subjects with alexithymia were analyzed using Children Alexithymia Measuring Scale (CAMS). Before and after the training period, the subjects were tested on body mass index (BMI) and anxiety. BMI was measured by using Karadascan Body Composition Monitor and anxiety was measured by using GAD7 measuring scale. Statistical analysis: Independent sample t-test and Analysis of Covariance (ANCOVA) was used as a statistical tool to examine any improvement after the training period for the experimental group and also to find out any difference between the experimental and control groups. Results: The result of the study shows that there is a decrease found in BMI and anxiety variables of children with alexithymia by practicing Suryanamaskar, Yoga Nidra, and pranayama. Conclusion: The experimental group practice of Suryanamaskar, Yoga Nidra, and pranayama has changed the BMI and anxiety positively after comparing with the control group and the results also indicated that there was a significant difference identified between the experimental group and control group on BMI and anxiety.

**Keywords:** Suryanamaskar, Yoga, Pranayama, BMI, Anxiety and Alexithymia

## 1. INTRODUCTION

Alexithymia is a personality trait that manifests as a subclinical failure to recognise and explain one's own feelings (Sifneos, 1973; Bagby,1994; Preece, 2017). Alexithymia is defined by significant impairments in emotional awareness, social attachment, and interpersonal relationships. [4] Furthermore, people with high levels of alexithymia may have trouble detecting and appreciating others' feelings, which is thought to contribute to unempathic and inefficient emotional responses (FeldmanHall, Dalgleish , & Mobbs, 2013). Alexithymia affects about 10% of the population and can be associated with a variety of psychiatric conditions as well as any neurodevelopmental disorder (Taylor , Bagby, & Parker, 1999).

It has previously been proposed that age, pubertal status (i.e. stage of maturation), and pubertal timing may all have a role in the emergence of psychopathology and elevated levels of subclinical sadness and anxiety (i.e. stage of maturation relative to same-aged peers (Dorn et al.,2017). In terms of age, research show that depressive symptoms grow with age (Hankin, et. al.1998; Hankin et al. 2015; Lewinsohn, et.al. 2000). whereas anxiety symptoms appear to diminish in early adolescence in ages 10 to 13–14 years and then rise again in late adolescence in ages 14–15 years (Costello, et. al. 2003; Van Oort, et.al. 2009).

Multiple studies have found that pubertal status and pubertal timing are linked to depressive and anxiety symptoms (Alloy, et.al. 2016; Hankin, 2009; Nolen-Hoeksema 1999) as well as the initiation of clinical depression and anxiety disorders (Tondo, et.al. 2017; Schuch, et.al. 2014; Kessler., et.al. 1994; Grant, 2005). When studying the impact of adolescence on mental symptoms, these findings underscore the need of accounting for pubertal stage and pubertal timing in addition to age.

Children Alexithymia Measuring Scale (CAMS) measures alexithymia in children and adolescents. The concept of alexithymia has been defined various ways. Simply stated, it is a lack of words for feelings more complexly stated, it is defined as having “difficulty identifying and describing feelings, difficulty distinguishing between feelings (Nemiah& Sifneos1970; Nemiah, et.al.1976) and bodily sensations, a lack of imaginative ability, and a focus on the external world rather than internal feelings. The Children’s Alexithymia Measure has a unidimensional factor structure and measures difficulties expressing feelings.

Discontentment, dissatisfaction, and frustration are all linked to psychological ill-health, as are other psychological issues. Such people's lives may appear miserable, insecure, and meaningless, and they may experience negative affect and psychological conflict as a result. One of yoga's most important accomplishments is physical and mental cleansing and strengthening (Satyananda, 2008). Asanas are specific posture patterns that use static stretching to help the mind and body relax (Gharote and Ganguly, 2001). Asanas also help to relieve physical stress, which is very important for today's busy people. Although many people consider themselves to be relaxed, their muscles are still tense.

Surya Namaskara, or Sun Salutation, is an important aspect of the yogic approach to these issues, and it is simple to incorporate into our everyday lives because it only takes five to fifteen minutes of practise per day to see positive outcomes. Surya Namaskara is a set of twelve asanas (physical postures). The spinal column and limbs are flexed and strengthened through their full range of motion in these alternating backward and forward bending asanas. The pingala nadi (right nostril) is regulated by regular sun salutation practise, whether it is underactive or overactive, resulting in a balanced energy system at both the mental and physical levels (Vivekananda, 2005). Surya Namaskara also has an effect on the pineal gland and the hypothalamus, which helps to avoid degeneration and calcification of the pineal gland

**Satyananda, 2003**). Surya namaskara practise affects the entire endocrine syste (**YogaMag, Brain: The Controller, 1991**) and boosts willpower (**Saxena, 2010**).

Yoga nidra is also known as "psychic sleep" or "conscious sleep." The body sleeps while the mind remains awake during yoga nidra, which is why it is referred to be a resting or sleeping practise that cultivates inner consciousness. Yoga nidra is based on the Tantric practise of nyasa, in which a mantra is mentally repeated while focusing on specific regions of the body (**Satyananda, 1984**). In the 1960s, Swami Satyananda Saraswati adapted and delivered yoga nidra in a systematic and scientific manner (**Bhushan & Sinha, 2001**). Yoga nidra encourages physical and mental relaxation, as well as improved circulation and a reduction in tension and anxiety. Researchers (**Chinmayananda, 1984; Nagendra & Nagarathna, 1997**) proposed that a combination of "activating" and "pacifying" techniques, such as yoga interspersed with rest while supine, may help achieve mental stability. In terms of mental health, yoga nidra has both preventive and curative benefits: it may be used to treat psychological disorders including depression, anxiety, sleeplessness, and drug dependence, as well as physical diseases like asthma, hypertension, and coronary heart disease.

## 2. MATERIALS AND METHODS

The main aim of the study was to examine the Effect of Suryanamaskar, Yoga Nidra, and pranayama practices on BMI and Anxiety among children with alexithymia.

### 2.1 Selection of Subjects

Forty-two children with alexithymia subjects were selected for this research study. The children residing at various residential schools around Krishna district, Andhra Pradesh. They were ranged from 8 to 12 years.

### 2.2 Training Process

The subjects selected for the present study were classified into two equal groups, each group consisted of twenty-one subjects, in which group - I experimental group underwent Suryanamaskar, Yoga Nidra and Pranayama and group - II acted as the control group, which did not undergo any practice. The intervention was conducted 5 days (Monday to Friday) per week for 9 weeks. The experimental group underwent their respective programs from 6.30 am to 7.30 am under the guidance of yoga experts for the period of nine weeks.

### 2.3 Yoga Practice Schedule

Morning 6.30am to 7.30 am	
Starting prayer	5min
Suryanamaskar	12 rounds
Pranayama	
Analomvilom	6 rounds
bhramari	6 rounds
Yoga nidra	20 min
Ending prayers	5 min
conversation	10 min

### 2.4 Procedure

The researcher chosen the criterion variables as follows: BMI and Anxiety. The BMI was measured with karadascan body composition monitor and Anxiety were measured by a GAD 7 scale (Robert et.al 2006) The data collection was conducted by asking the subjects to assemble at early morning, A data collection was done immediately after the 9 weeks training period completed. The subject of the present study were explained about the training and assured about their willingness of the study.

### 2.5 Statistical Analysis

The paired dependent - 't' test, and ANCOVA (Analysis of Covariance) was applied to find out the significant difference if any, between the experimental group and control group on selected criterion variables separately. In all the cases, .05 Significant level was fixed at 05 level of confidence, which was considered as appropriate. Whenever the 'F' ratios for post-test means were found significant, the Scheffe's test of post-hoc comparison was applied, The data were compiled and analyzed using the Statistical Package for the Social Science (SPSS) for windows computer software (Version 16).

### 3. RESULTS

The data collected on BMI and anxiety between experimental and control groups were analyzed and the results were presented.

#### 3.1 Body Mass Index

An analysis of covariance (ANCOVA) was conducted to test for mean differences between experimental and control group on body mass index after controlling initial mean difference effect. Table - 1 shows unadjusted and covariate adjusted descriptive statistics for body mass index in Alexithymia children.

**TABLE - I**  
**UNADJUSTED AND COVARIATE ADJUSTED DESCRIPTIVE STATISTICS FOR BODY MASS INDEX**

Group	Pre-Test			Post-Test (Unadjusted)		Post-Test (Adjusted)	Standard Error
	N	Mean	SD	Mean	SD	Mean	
Experimental	21	44.31	9.32	43.50	8.82	43.11	0.25
Control	21	43.50	7.58	43.80	7.58	44.19	0.25

Levene's test was not significant,  $F(1, 40) = 2.326, p > 0.05$ , indicating that the assumption of homogeneity of variance had been met. Therefore, the null hypothesis is rejected.

**TABLE - II**  
**ANALYSIS OF COVARIANCE FOR BODY MASS WITH PRE-TEST AS COVARIATE**

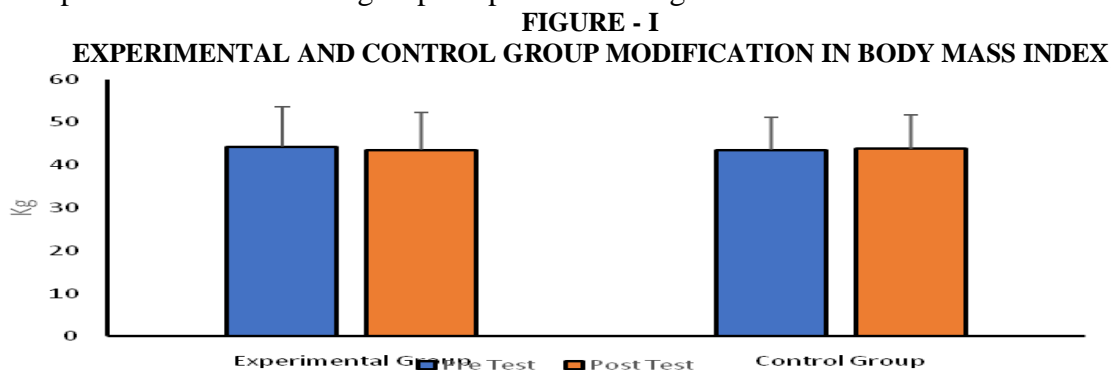
Source	SS	df	MS	F value	P value	$\eta^2$
Pre-Test as Covariate	2658.181	1	2658.181	2032.822	0.000	0.981
Groups	12.155	1	12.155	9.295	0.004	0.192
Error	50.998	39	1.308			

In table - II the results of ANCOVA, however, indicated that there was a significant difference between groups on adjusting post-test means,  $F(1, 39) = 9.295, p < 0.05, \eta^2 = 0.192$ . The adjusted means displayed difference between experimental group ( $M = 43.11, SE = 0.250$ ) and control group ( $M = 44.19, SE = 0.250$ ) on body mass this difference may be due to nine weeks of intervention in experimental group. Therefore, the null hypothesis is rejected and it displayed a significant difference between groups and elicited a modification of large effect size ( $\eta^2 = 0.192$ ). The covariate was also significant,  $F(1, 39) = 2032.822, p < 0.05, \eta^2 = 0.981$ , indicating that pre-test score had a significant effect on body mass index after nine weeks of intervention.

**TABLE - III**  
**DEPENDENT T TEST AND PERCENTAGE OF ALTERATION IN BODY MASS INDEX**

Group	Pre-Test (Mean $\pm$ SD)	Post-Test (Mean $\pm$ SD)	MD	t value	p value	% of alteration
Experimental	44.31 $\pm$ 9.32	43.50 $\pm$ 8.82	0.81	2.932	0.008	5.60
Control	43.50 $\pm$ 7.58	43.80 $\pm$ 7.58	-0.30	0.536	0.598	0.77

Table - III also explains the modifications within the group on body mass index. The alexithymia children in experimental group undergone modification in body mass index from pre to post test, nine weeks of Surya namaskar, Yoga nidra and pranayama intervention that significantly reduced their body mass,  $t = 2.932$ ,  $p = 0.008$ , & recorded 5.60% of decrement. In contrast, alexithymia children in control group failed to show significant modification in their body mass index,  $t = 0.536$ ,  $p = 0.598$ , & recorded 0.77%. The changes in body mass index in both experimental and control group are presented in figure - I.



### 3.2 Anxiety

An analysis of covariance (ANCOVA) was conducted to test for mean differences between Experimental and Control group on anxiety after controlling initial mean difference effect. Table 4 which clearly shows unadjusted and covariate adjusted descriptive statistics for anxiety in Alexithymia children.

**TABLE - IV**  
**UNADJUSTED AND COVARIATE ADJUSTED DESCRIPTIVE STATISTICS FOR ANXIETY**

Group	Pre-Test			Post-Test (Unadjusted)		Post-Test (Adjusted)	
	N	Mean	SD	Mean	SD	Mean	Standard Error
Experimental	21	15.57	1.80	8.19	1.03	8.165	0.264
Control	21	15.42	1.80	15.04	1.62	15.07	0.264

Levene's test was not significant,  $F(1, 40) = 0.087$ ,  $p > 0.05$ , indicating that the assumption of homogeneity of variance had been met. Therefore, the null hypothesis is rejected.

**TABLE - V**  
**ANALYSIS OF COVARIANCE FOR ANXIETY WITH PRE-TEST AS COVARIATE**

Source	SS	Df	MS	F value	P value	$\eta^2$
Pre-Test as Covariate	17.162	1	17.162	11.736	0.001	0.231
Groups	500.386	1	500.386	342.197	0.000	0.898
Error	57.029	39	1.462			

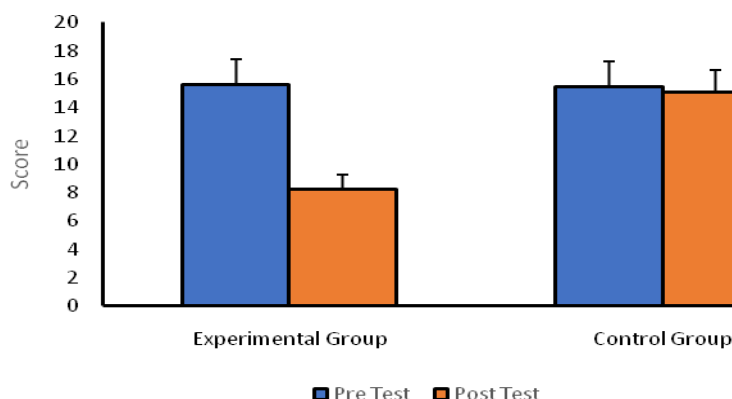
In table -V the results of ANCOVA, however, indicated that there was a significant difference between groups on adjusting post-test means,  $F(1, 39) = 342.197$ ,  $p < 0.05$ ,  $\eta^2 = 0.898$ . The adjusted means displayed difference between experimental group ( $M = 8.165$ ,  $SE = 0.264$ ) and control group ( $M = 15.07$ ,  $SE = 0.264$ ) on anxiety this difference may be due to nine weeks of intervention in experimental group.. Therefore, the null hypothesis is rejected and it displayed a significant difference between groups and elicited a modification of large effect size ( $\eta^2 = 0.898$ ). The covariate was also significant,  $F(1, 39) = 11.73$ ,  $p < 0.05$ ,  $\eta^2 = 0.231$ , indicating that pre-test score had a significant effect on anxiety after nine weeks of intervention.

**TABLE - VI**  
**DEPENDENT T TEST AND PERCENTAGE OF ALTERATION IN ANXIETY**

Group	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	MD	t value	p value	% of alteration
Experimental	15.57 ± 1.80	08.19 ± 1.03	7.38	17.47	0.000	47.39
Control	15.42 ± 1.80	15.04 ± 1.62	0.38	1.321	0.202	2.46

Table – VI also explains the modifications within the group on anxiety. The alexithymia children in experimental group undergone modification in anxiety from pre to post test, nine weeks of suryanamaskar and Yoga nidra intervention that significantly reduced their anxiety,  $t = 17.47$ ,  $p = 0.000$ , & recorded 47.39% of decrement. In contrast, alexithymia children in control group failed to show significant modification in their anxiety,  $t = 1.321$ ,  $p = 0.202$ , & recorded 2.46%. The changes in anxiety in both experimental and control group are presented in figure – II.

**Figure - II**  
**Experimental and control group modification**



#### 4. DISCUSSION

Yoga, when practiced regularly and under the supervision of a qualified instructor, has a different effect on obesity that is more long-lasting than other weight-loss methods (Bhardwaand Bhardwaj, 2015). Even low-intensity action, such as 10 minutes of Om chanting and kapalabhati, has been shown to cause psycho-physiological changes in the body (Bhogal et.al. 1993; Chander, et.al. 2011). As a result, it's probable that Surya namaskar's moderate workout will result in physical alterations. Murugavalavan and Jayanthi (2019) found that there was a significant decrease in BMI after the surya namaskar among obese working women. In a study the obese person has lost their body weight for four kilograms when compared with the control group (Nautiyal, 2016). Various researchers has found that yoga offers a flexible approach to a wide range of physical and psychological issues, with surprisingly positive results in the reduction of anxiety, stress, fatigue, and irritability (Miller, et.al. 1995; Sakai, 1997; Khasky, & Smith, 1999; Takeichi & Sato, 2000; Stetter& Kupper, 2002; Shenbagavalli & Divya, 2010).

Previous studies have suggested that yoga may impact on health reducing in body mass and anxiety among varied clinical population (Shirley , Vaishali and Balkrishna, 2009). A researcher found 5-month multi component behavioral intervention with yoga was associated with significant decreases in BMI it was reported that there was a decrease in anxiety (Adam, 2014). In current study hypothesized that 9 weeks of suryanamaskar, pranayama and Yoga nidra has reduced the anxiety level and body mass index of the children with alexithymia.

## 5. CONCLUSIONS

As per the current research, the surya namaskar, yoga nidra and pranayama was achieved a significant decrease in selected criterion variables such as anxiety and BMI among the children with alexithymia. Moreover, the surya namaskar, yoga nidra and pranayama practice group was significant differed when compared with the control group.

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