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Effect of Yogic Intervention: Surya Namaskar and Breathing Exercises on Stress Level of High School Girl Students

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ABSTRACT

When an individual faces stressful situations it might have adverse individual and societal consequences. Existing studies show the positive effect of yogic interventions on mood states. In this experimental study, Surya Namaskar and breathing exercises are taken as yogic interventions to investigate the effect of Surya Namaskar and breathing exercises on stress levels of high school female students. Thirty adolescent female students were assessed for the study. Practice of Surya Namaskar and breathing exercises took place over 12 weeks. The stress scale developed by Vijaya Lakshmi and Shruti Narain (Patna) was used to measure the stress level at the start and end of the study. Analysis of the results shows that there is a positive effect of Surya Namaskar and breathing exercises on the stress level of the experimental group as well as the group expressing positive reviews after experiencing the practice.

Keywords: Yoga, Students, Surya Namaskar, Breathing Exercises, Stress, Experimental study

INTRODUCTION

In today's world, stress has become a defining challenge in the lives of adolescents, particularly high school girl students. This stage of life is marked by rapid physical, emotional, and social changes, combined with increasing academic expectations. For girls, the experience of stress is often intensified by gender-specific pressures, such as societal expectations, body image concerns, and balancing multiple roles at school and home.

Key Sources of Stress:

- Academic Pressure: High competition, demanding curricula, and exam performance expectations often lead to anxiety and burnout (Pavithra and Lokesh, 2025).
- Psychological and Emotional Factors: Adolescents face heightened vulnerability to stress-related issues such as anxiety and depression, with girls often reporting higher emotional sensitivity.
- Social Expectations: Peer relationships, parental expectations, and cultural norms can create additional stress, particularly in contexts where girls are expected to excel academically while conforming to traditional roles.
- External Events: Situations like the COVID-19 pandemic have further amplified stress levels, disrupting routines and increasing uncertainty.

Impact of Stress

Stress in high school girls manifests in both psychological and physical ways (Cymbiotika, 2025). It can lead to:

- Reduced academic performance due to concentration difficulties.
- Emotional challenges such as anxiety, irritability, or low self-esteem (Perumal and Ratheeswari,

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2024).

- Physical symptoms including headaches, fatigue, and sleep disturbances (Meesripong *et al.,* 2024)..
- Long-term risks of mental health disorders if unmanaged.

Yoga is widely recognized as a powerful tool for managing stress because it integrates physical movement, breathing techniques, and mindfulness practices. Together, these elements calm the nervous system, reduce tension, and promote emotional balance.

Mechanisms of Stress Relief:

- ***Physical Relaxation***: Yoga postures (asanas) release muscle tension, improve circulation, and reduce physical symptoms of stress such as headaches or fatigue.
- ***Breathing Control (Pranayama)***: Slow, deep breathing activates the parasympathetic nervous system, lowering heart rate and blood pressure, which counteracts the body's stress response.
- ***Mindfulness and Meditation:*** Yoga encourages present-moment awareness, helping individuals detach from stressful thoughts and cultivate mental clarity.
- ***Hormonal Balance:*** Regular practice has been shown to reduce cortisol (the stress hormone) and increase serotonin, supporting emotional stability.
- ***Resilience Building:*** By combining physical and mental discipline, yoga enhances coping skills and resilience against everyday stressors.
- ***Reduces Anxiety:*** The practice of Pranayama, Yoga and meditation controls the limbic hypothalamus axis. This reduces anxiety and reduces the high level of stress hormones present in the blood.
- ***Increases The Level of Positive Hormones:*** It also increases the level of beneficial hormones like adrenaline and enkephalin. These two hormones have a positive effect on our body and strengthen the immune system.

Systematic reviews highlight that yoga reduces both psychological and physiological stress markers, making it effective for anxiety and depression management (Khajuria *et al.*, 2023). Scientific studies show yoga improves mental resilience, lowers cortisol levels, and promotes relaxation through controlled breathing and meditation.

METHODOLOGY

Research Problem:

Our research problem is to find out the effect of Yogic Intervention: Surya Namaskar and breathing exercises (Pranayama) on the stress level of high school girl students (Jain and Sharma).

Research Hypothesis:

After Going through the reviews, we constructed our hypothesis:

- There would be positive effects of Surya Namaskaar and Breathing Exercises (Pranayama) on Stress.

Research Design:

This was a pre and post research design, where the independent variable, Yogic intervention was introduced to the participants. The stress level was measured pre study period, after one month, after two months and post study, *i.e.*, after three months.

***Independent Variables in the study*:** Surya Namaskar, Breathing Exercises

***Dependent Variable in the study*:** Stress

Sample Selection:

A total of thirty students from one school of the suburban area of Baraut, Uttar Pradesh were selected. Our sample technique was purposive. We needed the participants who were low or average in socio economic status.

Research Tools:

Stress Scale (SS-LVNS):

Author:	Dr (Mrs.) Vijaya Lakshmi and Dr. Shruti Narain
Nature:	Individual/Group
Structure:	40 items
Age-range:	12-24 Years
Duration:	10-15 minutes (approx)

Table 1 : Qualitative Interpretation of Stress Scale Scores for Females

Dimension	High Stress	Moderate Stress	Low Stress
Overall Stress	25 and above	14 to 24	0 to 13

Intervention Procedure:

The Exercise of Surya Namaskar and Breathing Exercises was given to every participant in early morning

Practice	Duration / Repetitions
Bhastrika Pranayama	2–3 minutes
Kapalbhati Pranayama	5–6 minutes
Surya Namaskar	8–10 rounds
Anulom Vilom Pranayama	5 minutes
Bhramri Pranayama	5 times
Udgeeth Pranayama	5 times
Pranav Pranayama	2 minutes
	Total Time: 20-25 minutes

or at least with a gap of 4-5 hours after taking his meals. The duration was 20-25 minutes.

The research scholar herself was given the training as she obtained "Yoga Protocol Instructor" from The Yoga Certification Board, Ministry of Ayush, Govt. of Bharat. The intervention of exercises was given in the correct method, time limit and precautions, which are discussed in the 'Introduction' chapter. The research scholar has also been trained in Patanjali Yogpeeth, Haridwar under the supervision of Swami Ramdev. So we tried to train the participants by the right method and they were asked to follow the procedure strictly at least one time for 20-25 minutes. Thus the study was conducted for three months. The members of the experimental group were observed everyday for three months.

RESULTS AND DISCUSSION

This was a three months study where Stress was measured before the training, after one month, after two months and finally after three months using standardized scales. This section presents the findings derived from the collected data. Results are reported through descriptive and inferential statistics (Table 2).

Table 2 : Variables and their Abbreviation

Variable	Abbreviation
Stress Pretest	SS1
Stress after one month	SS2
Stress after two months	SS3
Stress Posttest	SS4

Before choosing and applying the statistical techniques, the normality of the collected data was measured using Kolmogorov-Smirnov Test (Table 3).

Table 3: Normality Test Results of Stress

Variable	Skewness	Kurtosis	Kolmogorov–Smirnov Statistic	p-value	Normality Assumption
SS1	0.39	-0.94	0.15	0.47	MET
SS2	0.09	-0.37	0.17	0.34	MET
SS3	0.09	-0.92	0.13	0.67	MET
SS4	0.06	-1.21	0.18	0.24	MET

The stress score mean and standard deviation is calculated (Table 4):

Table 4 : Mean and S.D. of the Scores

Variable	Experimental Group [N=30]	
	Mean	S.D.
SS1	22.67	7.04
SS2	20	5.87
SS3	19	5.04
SS4	18.3	4.1

The obtained data is examined using one way repeated measures ANOVA and paired T test (Table 5).

Table 5 : ANOVA Summary

Source	SS	df	MS	F
Subjects	2159.74	29	-	-
Conditions	330.03	3	110.01	6.3668
Error	1503.22	87	17.28	-
Total	3992.99	-	-	-

F (3,87) = 6.3668
p-value = 0.000595

A repeated measures ANOVA revealed a significant result, $F(3, 87) = 6.37$, $p < .001$, $\eta^2 = 0.08$. The ANOVA calculation shows the significant effect of the intervention at four stages. P value is less than 0.001 shows the result is significant at 99% level. The intervention

Table 6 : Experimental Group Comparison of Stress Pre-position and the experimental conditions *i.e.* after one month, two months and three months

Variable I	Variable II	Mean Difference (I-II)	Effect Size	t- Value df=29	p-Value
SS1	SS2	2.67	0.4	2.2	0.35
	SS3	3.67	0.52	2.8	0.008
	SS4	4.37	0.53	2.9	0.006
SS2	SS3	1	0.39	2.1	0.043
	SS4	1.7	0.35	1.9	0.064
SS3	SS4	0.7	0.18	1	0.345

treatment has a significant effect on the experimental group.

The obtained data is further examined using paired sample T test (Table 6).

The data shows that there is a significant difference between pre-intervention and after two months and after three months. There is a slight difference before intervention and after one month of intervention. There is a significant difference after one month and after two months while there is a slight difference between after one month and after three months. There is a slight difference between after two months and after three months.

The Fig. 1 shows the mean difference between pre, after one month, after two months and after three months of intervention

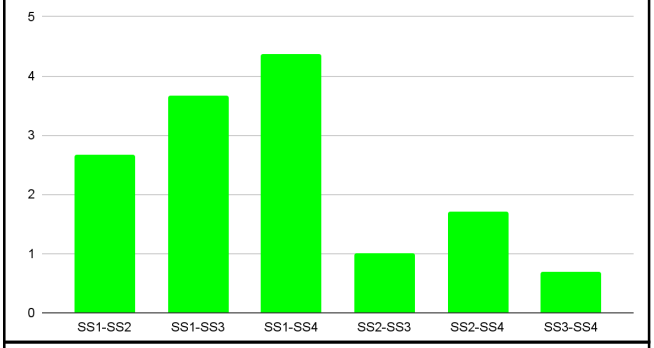

Fig. 1 : Experimental Group Comparison of Stress Pre-position and the experimental conditions *i.e.* after one month, two months and three months

Conclusion:

First of all, Recognizing and addressing stress among high school girl students is crucial for their overall well-being. Schools, families, and communities must provide supportive environments, encourage healthy coping strategies, and reduce unnecessary pressures. By doing so, adolescents can navigate this critical developmental stage with resilience and confidence.

Yoga emerges as a holistic and effective approach to combating stress, particularly in the lives of adolescents and students. By integrating physical postures, controlled breathing, and mindfulness, yoga not only reduces the physiological markers of stress but also strengthens emotional resilience. Regular practice helps lower cortisol levels, improves concentration, enhances sleep quality, and fosters a sense of inner calm.

For high school girl students, who often face the dual burden of academic pressure and social expectations, yoga provides a safe and accessible coping mechanism. It empowers them to manage anxiety, maintain emotional balance, and cultivate self-confidence. Beyond immediate relief, yoga nurtures long-term well-being by instilling habits of mindfulness and self-care that extend into adulthood.

In essence, yoga is not merely a physical exercise but a comprehensive lifestyle practice that equips young individuals to navigate stress with clarity, strength, and serenity. Its positive effects underscore the importance of integrating yogic exercises Surya Namaskara and Breathing Exercises (Pranayama) into educational and personal routines as a sustainable strategy for mental health and overall development.

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