



Comparative Effect Of Aerobic Exercises And Yogic Practices On Perceived Stress Among School Girls

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Abstract: The present study aimed to examine the comparative effects of aerobic exercises and yogic practices on perceived stress among school-going girls. A total of 300 students from Jawahar Navodaya Vidyalayas (JNVs) in the Upper Assam District of Assam, aged between 13 and 17 years, were selected and divided into three groups: aerobic (n = 100), yogic (n = 100), and control (n = 100). Only the two experimental groups underwent a structured 12-week training program. The Perceived Stress Scale (developed by Cohen, Kamarck, and Mermelstein, 1983) was used to assess stress levels before and after the intervention. Data were analyzed using Jamovi software (version 2.6.13). Shapiro-Wilk test confirmed normality ($p = 0.53$). A dependent t-test and ANCOVA were used to analyze the data, with the level of significance set at 0.05. ANCOVA results showed no significant difference in adjusted post-test means between groups ($F = 2.22$, $p = 0.129$), so post hoc tests were not conducted. However, paired t-test results revealed significant reductions in perceived stress within the aerobic ($t = 6.23$, $p = 0.001$), yogic ($t = 4.83$, $p = 0.001$), and control ($t = 5.24$, $p = 0.001$) groups. Since the control group also showed improvement, the observed changes may be attributed to factors such as school schedules or academic environment rather than the training interventions alone. The study recommends that future interventions integrate physical activities with mindfulness, counselling, or creative therapies to more effectively promote the emotional well-being of students.

Index Terms: Perceived Stress, Aerobic Exercise, Yogic Practices, School Girls, Jawahar Navodaya Vidyalayas (JNVs), Training Intervention, Emotional Well-being.

1. Introduction

In recent years, there has been a growing recognition of the impact of stress on the mental health and academic performance of adolescents, particularly school-going girls (Verma & Gupta, 2020). Among the various psychological constructs, perceived stress—defined as the degree to which situations in one's life are appraised as stressful (Cohen, Kamarck, & Mermelstein, 1983)—has gained significant attention in school-based mental health research. Physical activity interventions, such as aerobic exercise and yogic practices, have been identified as effective non-pharmacological strategies for reducing stress and enhancing emotional well-being (Ross & Thomas, 2010; Sharma et al., 2019). However, comparative evidence on their effectiveness among adolescent populations in structured school settings remains limited. This study was designed to investigate the comparative effects of aerobic exercises and yogic practices on perceived stress among adolescent girls from Jawahar Navodaya Vidyalayas (JNVs) in Upper Assam, aiming to provide evidence-based recommendations for school-based mental wellness programs.

2. Significance of the Study

- 2.1 The present study highlights perceived stress as a key factor affecting adolescent girls' mental health and academic performance.
- 2.2 The findings help schools like JNVs design activity programs that boost mental strength and overall growth in adolescents.
- 2.3 The study shows that aerobic and yogic practices are effective, low-cost ways to reduce student stress.
- 2.4 It would also help physical education teachers as well as coaches to design training plan.

3. Purpose of the Study

The purpose of this study was to compare the effects of aerobic exercises and yogic practices on perceived stress among adolescent girls studying in Jawahar Navodaya Vidyalayas (JNVs) of Upper Assam.

4. Hypothesis

It was hypothesized that there might be significant difference in perceived stress of the students due to aerobic exercises and yogic practices while compared to the students with daily normal routine work.

5. Methodology

5.1 Sources of Data

The data required to examined was collected from JNVs of Upper Assam District of Assam, India.

5.2 Selections of Subjects

5.2.1 A total of 300 girl students were selected as subjects and equally divided into three groups: aerobic (n = 100), yogic (n = 100), and control (n = 100).

5.2.2 Aged were ranging from 13 to 17 years

5.3 Sampling Procedure

Simple Random Sampling Method was adopted for selection of subjects

5.4 Tools and Criterion Measures

Perceived Stress Scale questionnaire (developed by Cohen, Kamarck, and Mermelstein, 1983) was used and the score was recorded in numbers.

5.5 Collection of Data

The necessary score required to examine for the test were collected before the administration of the training and immediately after completion of the training program, keeping in mind the clear instruction was given before applying any test to the subjects.

5.6 Administration of Training Program

The 12-week training program was implemented for the experimental groups only, five days a week, with no sessions on Sundays. It began with 50-minute sessions during the first two weeks, increased to 55 minutes in the third and fourth weeks, and was further extended to 75 minutes during the final two weeks to allow for gradual adaptation and improved effectiveness.

6. Analysis of Data

The data were statistically analyzed using JAMOV software (version 2.6.13). To test the hypotheses, dependent t-tests and Analysis of Covariance (ANCOVA) were employed to determine the significance of differences and the effects of the interventions, with the level of significance set at 0.05.

Table no.01

Testing of Normality

Dependant Variables	Mean	SD	Sk	Ku	Shapiro-Wilk	
					W	p value
Perceived Stress (Aerobic/Yoga/control group)	21.5	3.95	-0.298	0.604	0.971	0.53

Sk= Skewness, **Ku**= Kurtosis, **W**= Shapiro Wilk Coefficient, **p value**= Shapiro Wilk p

Prior to statistical analysis, the assumption of normality was assessed using the Shapiro-Wilk test in JAMOV software. The results indicated no violation of normality, $W = 0.971$, $p = 0.53$ ($p > 0.05$).

Table no.02

Description of Mean, Standard Deviation and t ratio for the Pre and Post Test Data Analysis on Perceived Stress Test of Aerobic Group

Variables	Mean		S.D.		Mean diff. (MD)	S.E. of Mean Diff.	t ratio	p value
	Pre test	Post test	Pre test	Post test				
Perceived Stress	22.8	25.3	2.49	2.50	2.50	0.401	6.23	0.001*

Table no.02 presents the obtained t-value ($t = 6.23$, $p = 0.001$), indicating a highly significant difference ($p < 0.05$) between the pre-test and post-test means of the aerobic group.

Table no.03

Description of Mean, Standard Deviation and t ratio for the Pre and Post Test Data Analysis on Perceived Stress Test of Yogic Group

Variables	Mean		S.D.		Mean diff. (MD)	S.E. of Mean Diff.	t ratio	p value
	Pre test	Post test	Pre test	Post test				
Perceived Stress	23.6	27.4	3.44	3.06	3.80	0.786	4.83	0.001*

Table no.03 presents the t-value ($t = 4.83$, $p = 0.001$), indicating a highly significant difference ($p < 0.05$) between the pre-test and post-test means of the yogic group.

Table no.04

Description of Mean, Standard Deviation and t ratio for the Pre and Post Test Data Analysis on Perceived Stress Test of Control Group

Variables	Mean		S.D.		Mean diff. (MD)	S.E. of Mean Diff.	t ratio	p value
	Pre test	Post test	Pre test	Post test				
Perceived Stress	18	21.6	3.46	3.06	3.60	0.686	5.24	0.001*

Table no.04 presents the t-value ($t = 5.24$, $p = 0.001$), indicating a highly significant difference ($p < 0.05$) between the pre-test and post-test means of the yogic group.

6.1 Computation of ANCOVA to Assess the Effect of the Training Program on Perceived Stress After Adjusting for Pre-Test Scores

Table no.05

6.1.1 Analysis of Covariance (ANCOVA) for Perceived Stress Score

Adjusted Mean			Source of Variance	Sum of Square	Mean Squares	df	F-Ratio	P Value
Control Group	Aerobic Group	Yoga Group						
24.1	24.4	25.9	Treatment Group	15.3	7.63	2	2.22	0.129 [@]
			Error Group	89.5	3.44	296		

Table no.05

6.1.2 Description of Pretest, Posttest and Adjusted Mean of Perceived Stress Test for Analysis of Covariance

Groups	Pre Test Mean	Post Test Mean	Adjusted Mean
Control	18	21.6	24.1
Aerobic	22.8	25.3	24.4
Yoga	23.6	27.4	25.9

Table no.04 presents the results of the Analysis of Covariance (ANCOVA) based on the adjusted means shown in Table 5. The findings indicated no statistically significant difference among the groups after the 12-weeks of training program ($F = 2.22$, $p = 0.129$; $p > 0.05$). Therefore, a post hoc Tukey test for pairwise mean comparison was not conducted.

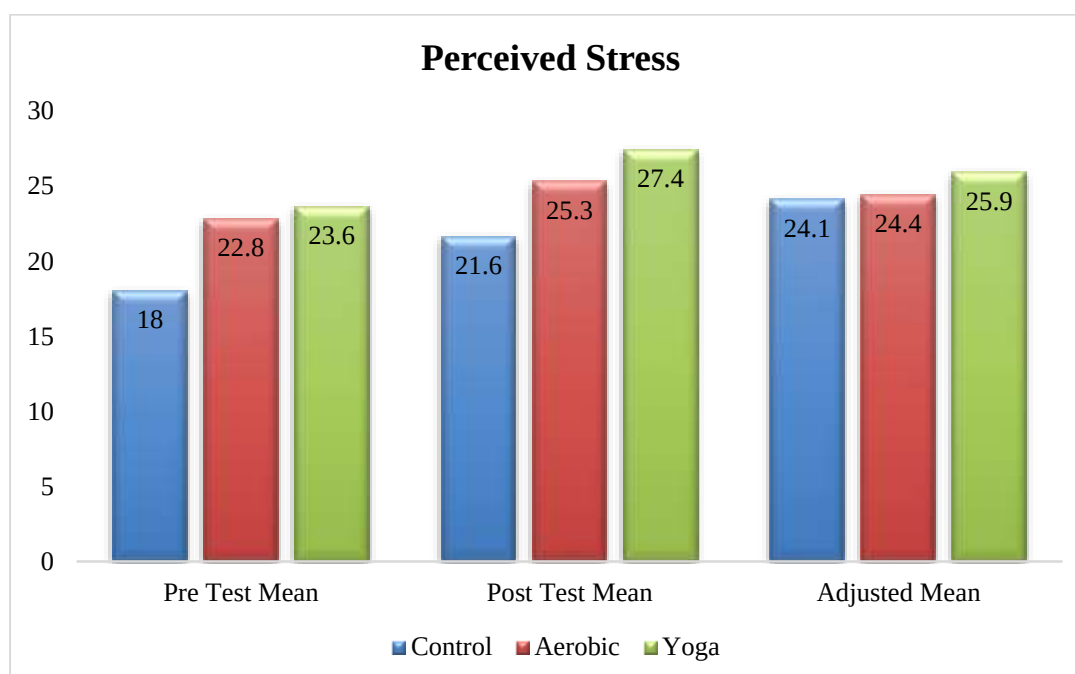


Fig no.01: Diagram Showing Pretest Mean, Posttest Mean and Adjusted Mean Comparison of Perceived Stress Score among Aerobic, Yogic and Control Group

7. Discussion on Finding

The findings from Tables 05 and 06 indicate that the interventions did not lead to a statistically significant reduction in perceived stress. This highlights that structured physical routines alone may be inadequate for effectively managing stress in adolescents, underscoring the need for more comprehensive approaches—such as integrating mindfulness, counselling, or emotional support strategies—to achieve meaningful psychological outcomes.

8. Conclusions

8.1 The results suggest that more comprehensive strategies—such as combining physical activities with mindfulness, counselling, or emotional wellness programs—may be necessary to effectively address adolescent stress.

8.2. The absence of significant differences among the groups emphasizes that physical activity interventions like aerobic and yogic practices, when applied in isolation, may not be sufficient to counteract perceived stress in adolescent girls.

8.3 It is recommended that integrated approach that combines physical training with psychological, emotional, and social support systems to achieve more measurable and lasting outcomes.

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