NIILM University International Journal of Applied and Behavioural Sciences (IJABS)

ISSN:3048-9083 Vol.02, Issue 02, Jul-Dec 2025

Efficacy of yoga practices on BMI among college students with polycystic ovary syndrome

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DOI: https://doi.org/10.70388/ijabs250132

Received on Dec 28, 2024

Accepted on Feb15, 2025

Published on July18, 2025

Abstract

This study examines the effectiveness of yoga as a complementary therapy for managing stress among college students diagnosed with Polycystic Ovarian Syndrome (PCOS). A total of 120 participants from various academic disciplines in Vijayawada, Krishna District, were randomly assigned to either an experimental group, which engaged in daily yoga practices—including Surya Namaskar, Asanas, Mudras, Meditation, and Pranayama—or a control group, which participated in active rest over a six-month period. Body Mass Index (BMI), calculated using the standard formula of weight in kilograms divided by height in meters squared, was used as an indicator of physical health. Originally devised by Adolphe Quetelet in the 1830s and later named by Ancel Keys in 1972, BMI serves as a screening tool to assess weight-related health risks. Weight was measured using a weighing scale. Quantitative analysis, including descriptive statistics (mean, standard deviation) and inferential statistics (t-test),

was conducted to assess the impact of yoga. Results indicated a significant reduction in stress levels among students practicing yoga, suggesting that incorporating yoga into PCOS management may improve mental well-being and overall health outcomes in young women.

Keywords: Yoga, BMI, College students and Polycystic Ovarian Syndrome (PCOS)

Introduction

Polycystic Ovary Syndrome (PCOS), a hormonal disorder affecting reproductive-aged women and girls and impacting approximately 13% of college students, presents unique challenges including androgen excess, ovarian dysfunction, polycystic ovarian morphology, heightened stress, anxiety, poor sleep, hormonal imbalances, and BMI fluctuations. These issues are often amplified by academic pressures and limited healthcare access. To address this understudied intersection, our research investigates the potential of yoga practices to improve the overall well-being of college students aged 18-25 with PCOS. By focusing on yoga's ability to optimize hormonal balance, this study aims to contribute crucial knowledge towards regulating menstrual cycles and potentially enhancing future fertility in this vulnerable population.

Yoga and BMI

This study rigorously evaluates the effectiveness of yoga as a complementary therapy for college students diagnosed with Polycystic Ovarian Syndrome (PCOS), with Body Mass Index (BMI) serving as a primary marker of physical health outcomes. Recognizing that while BMI has limitations in the nuanced context of PCOS, where insulin resistance and abdominal adiposity complicate weight assessment, it remains a widely accepted and practical screening tool for weight status and associated health risks. Yoga's potential to

manage BMI in PCOS is explored through its mechanisms of promoting modest weight loss, enhancing insulin sensitivity, reducing stress, and balancing hormones, supported by existing research highlighting its positive impact on metabolic and mental well-being, which indirectly supports healthy BMI levels.

A cohort of 120 college students from diverse academic disciplines within Vijayawada, Krishna District, was prospectively and randomly allocated to either a six-month experimental group engaging in a structured daily yoga protocol—comprising Surya Namaskar, Asanas, Mudras, Meditation, and Pranayama—or an active rest control group. BMI, calculated as weight (kg) divided by height (m^2), a metric with historical validity dating back to Quetelet and later formalized by Keys, was assessed using standardized weighing scales at baseline and post-intervention. The study's findings revealed statistically significant improvements in BMI within the yoga intervention group.

Framed within the World Health Organization's holistic definition of health, yoga is presented as a comprehensive self-care practice that extends beyond physical conditioning to enhance mindfulness, emotional regulation, and positive lifestyle choices. Grounded in ancient wisdom and classical yogic texts such as Patanjali’s Yoga Sutras, Hatha Yoga Pradeepika, and Gheranda Samhita, the study acknowledges yoga's eight-limbed philosophy as a pathway to comprehensive well-being. The observed benefits of regular yoga practice, including reduced sympathetic nervous system activity, improved mental clarity, and enhanced overall well-being, suggest that integrating yoga into PCOS management can yield significant benefits for physical health, as evidenced by BMI improvements, and mental health by alleviating stress, anxiety, and depression—thereby fostering a greater capacity for sustained lifestyle modifications conducive to healthy weight management.

Purpose of the Study

The present study was to find out whether there would be any significant difference in BMI among college students with PCOS.

Hypothesis

1. It was hypothesized that there will be no significant difference in BMI levels between the yogic practices group and the control group at the pre-test among college students with PCOS.
2. It was hypothesized that there will be a significant difference in BMI levels between college students with PCOS in the yogic practices group compared to those in the control group at the post-test.
3. It was hypothesized that there will be a significant difference in BMI between pre-test and post test of experimental group of college students with PCOS

Review of Related Literature

Jain vanita et.al2020 conducted research conducted in 2016 on adolescents' girls After Yoga (Posttest-1): High-risk cases dropped to 5.9% in the experimental group (vs 12.7% in control) Concluded that Lifestyle modifications, particularly yoga and exercise, significantly reduced PCOS risk among adolescent girls. Broader implementation across schools is recommended for wider health benefits

Anita Verma et.al2021 doi: 10.1177/15598276211029221 This systematic review and meta-analysis highlights the potential benefits of yoga therapy (YT) on reproductive, metabolic, and anthropometric health anthropometric (BMI and WHR) health outcomes in women suffering from PCOS outcomes in women with PCOS, such as improved menstrual regularity, reduced clinical hyperandrogenism, and better blood sugar and insulin markers.

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YT, which integrates diet, exercise, and behavioral changes, may serve as a safe and affordable complementary treatment. However, the review was limited by the inclusion of only two randomized controlled trials with small sample sizes and the inability to blind participants. To build stronger evidence, future well-designed clinical trials with larger and more diverse populations, longer follow-up, and standardized YT protocols are recommended

Methodology

The purpose of the study was to analyze the outcomes of yoga practices compared to a control group. This study examined the impact of yoga practices on selected Anthropometric variable BMI, comparing the outcomes of participants in a yoga intervention group with those in a control group. To achieve the purpose of this study, randomly selected 120 college students age group of 18 to 25 years, randomly selected from various academic disciplines in Vijayawada, Krishna District, participated. These students were randomly assigned to either the experimental group, which engaged in daily yoga practices—including Surya Namaskar, Asanas, Mudras, Meditation, and Pranayama—and the control group, which participated in active rest for six months.

The dependent variable selected for this study was Anthropometric variable BMI, which was measured using the weighing scale and with height measuring scale. The participants were divided into two groups: the yoga practice group and the control group, with each group consisting of 60 participants. A random group experimental design was used for this study. A pretest was conducted for both groups (A and B) on the selected dependent variable. Group A underwent yoga practice, while Group B continued with their normal lifestyle. The participants were tested on the selected variable before and after the training program.

The data collected from both groups before and after the training program on the selected

variable were statistically analyzed using the ‘t’ test.

The primary aim of this study was to examine the impact of yoga practices on Anthropometric variable BMI, comparing the outcomes of participants in a yoga intervention group with those in a control group. In order to achieve this objective, 120 college students, aged between 18 and 25 years, were randomly selected from various academic disciplines at colleges in Vijayawada, Krishna District. These participants were randomly assigned to one of two groups: an experimental group, which engaged in a daily yoga practice, and a control group, which participated in a program of active rest for a duration of six months.

The experimental group practiced a range of yoga techniques, including Surya Namaskar (Sun Salutation), various Asanas (physical postures), Mudras (hand gestures), Pranayama (breathing exercises), and Meditation. The control group, on the other hand, followed a program that allowed them to engage in light physical activity or rest, but without any structured yoga practice.

The dependent variable selected for this study was Anthropometric variable BMI, which was measured using the weighing scale and height measuring scale. The participants were initially divided into two groups, the yoga practice group and the control group, with each group consisting of 60 individuals.

A random group experimental design was employed to ensure the random assignment of participants to the two groups, which helped eliminate bias and ensured that the groups were comparable at the outset. To measure the effectiveness of the intervention, a pretest was administered to both groups to assess their perceived stress levels before the commencement of the study. After the six-month intervention, both groups were re-assessed using the same

measuring scales.

The data collected from both groups (pretest and posttest results) were analyzed using statistical methods. Specifically, a paired 't' test was employed to compare the changes in BMI levels within each group from pretest to posttest. This statistical test was chosen because it allows for the evaluation of significant differences between the two measurements (before and after the intervention) for each group individually.

By using this approach, the study aims to provide insights into the potential effects of yoga on reducing BMI in college students. The findings from this study may contribute valuable information regarding the role of yoga in BMI, particularly for individuals facing challenges of higher BMI due to insulin resistance and hormonal imbalances, which promote weight gain, particularly abdominal fat. This increases risks for diabetes, heart disease, and infertility.

Result and Discussion

The pre - test and post- test means of the experimental groups and control group statistically analyzed to find out the significance of Stress.

Table-1: Shows the significance of difference between Mean scores on stress among college students according to their group at pre-test. (N=120)

Variable	**Sample Size**	**Mean**	**S.D**	**T-Value**
Experimental	60	30.741	6.02	0.851
Control	60	31.343	5.68	

Not Significant

The mean scores of experimental and controlled groups were 30.74 and 31.34 respectively and their S.D scores were 6.02 and 5.68 respectively.

The t-value 0.851 was not significant at any level of significance. It shows that there was no significant difference between experimental and controlled group at pretest. Hence, the null hypothesis "there is no significant difference between experimental and control group on BMI among college students with PCOS was accepted.

Table-2: Shows the significance of difference between Mean scores on BMI among college students according to their group at Post-test. (N=120)

Variable	Sample size	Mean	S.D	T-value
Experimental	60	24.038	4.19	9.97
Control	60	33.545	5.94	

***Significant at 0.01 Level**

The mean scores of the Experimental and controlled group were 24.03 and 33.54 respectively and their S.D scores were 4.192 and 5.940 respectively.

The t-value 9.97 was not significant at any level of significance. It shows that there was a significant difference between experimental and controlled group at pretest. Hence, the hypothesis "there is a significant difference between experimental and control group on BMI among college students with PCOS was accepted.

Table-3: Shows the significance of difference between pre-test Mean scores and post-test Mean scores on BMI among college students according to experimental group\(N=60)

Test	Sample Size	Mean	S.D	T-value
Pre-Test	60	30.741	5.14	7.83
Post-Test	60	24.038	4.19	

***Significant at 0.01 Level**

The table highlights mean scores of the experimental group were 30.74 and 24.03 respectively and their S.D scores were 5.14 and 4.19 respectively.

The t-value 7.83 was significant at any level of significance. It shows that there was significant difference between the experimental group at pretest and post test. Hence, the hypothesis "there is significant difference on pre and post test levels between experimental group on BMI among college students with PCOS was accepted.

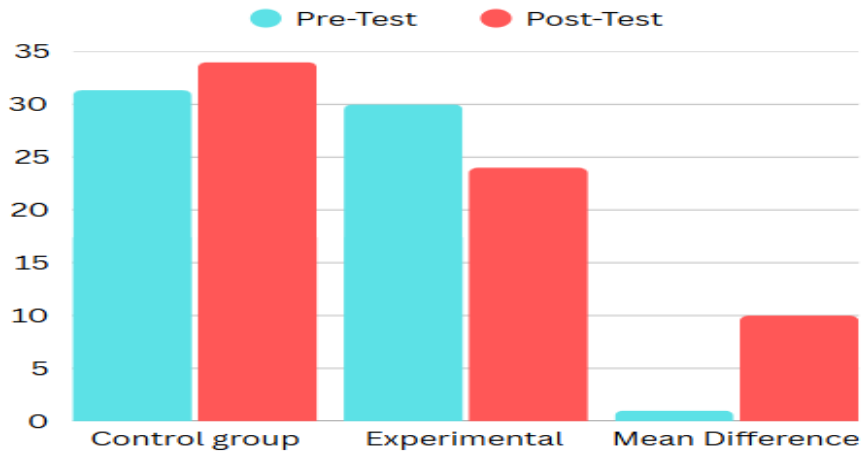

Figure 1: Bar Diagram Showing the Mean Difference Among experimental

	Pre-Test	**Post-Test**
Control Group	31.343	33.545
Experimental Group	30.741	24.038
Mean Difference	**0.602**	**9.507**

The results of the study showed that BMI reduced significantly for the experimental group. Hence the hypothesis was accepted at 0.01 level of confidence. The analysis on BMI of experimental group and control group was analyzed and are presented in the graph.

Conclusion

Yoga, with its emphasis on the mind-body-soul connection through movement, breath, and mindfulness, presents a powerful approach to weight reduction and overall well-being. Research indicates that yoga is an effective alternative method for reducing Body Mass Index (BMI) and promoting health. Specifically, for individuals with Polycystic Ovary Syndrome (PCOS), yoga can aid in managing BMI by facilitating modest weight loss, enhancing insulin sensitivity, mitigating stress, and fostering hormonal balance.

Beyond weight management, all forms of yoga contribute to increased physical capability, improving flexibility and strength in women, and demonstrably lowering BMI levels. Studies have shown a significant difference in BMI reduction between yoga practitioners and control groups, underscoring the effectiveness of yoga in decreasing BMI among college students with PCOS.

In essence, yoga offers a holistic and evidence-backed approach to improving health markers and managing the complexities of PCOS.

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