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## The influence of yogic and aerobic activities on anxiety among high school students

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### Abstract

The aim of the current study was to investigate the impact of yogic exercises and aerobic exercises on the anxiety levels of secondary schoolchildren. To fulfill this objective, 150 students enrolled across different grades at Kendriya Vidyalaya, Ambajhari, Nagpur, Maharashtra, aged between 14 to 16 years, were selected. These participants were divided into three equal groups, each consisting of 50 subjects. Group-I participated in yogic exercises, Group-II engaged in aerobic exercises, while Group-III acted as the Control Group. The training sessions spanned 16 weeks in the morning. Data collection occurred both before and after the training period, and the gathered experimental data underwent rigorous statistical analysis to discern significance. Annas Group I and Group II underwent the 16-week training duration. Statistical analysis was conducted using analysis of covariation, revealing a statistically significant improvement post-training. The "F" ratio indicated significance, and Scheffe's Test was employed as a post-test to identify the significantly differing paired means. In all instances, the standard criteria for statistical significance were set at a confidence level of 0.05 ( $p < 0.05$ ).

**Keywords:** Information technology sector, growth of employment, opportunities

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### Introduction

Similar to numerous profound arts and sciences, yoga has suffered in the modern world due to spiritual impoverishment, diminishing its essence into clichés, trivializing its beauty, and exploiting its power for personal gain. Clever individuals have misrepresented yoga, turning it into a mere exercise program available on videotapes or packaging it as a cult religion to allure followers. The original clarity of yoga has been clouded by this confusion, necessitating a redefinition and clarification of its true meaning and purpose.

Yoga defines itself as a science, a practical and systematic discipline aiming to awaken individuals to their deepest nature. Its pursuit is not religious but an experiential journey of self-study rooted in the concrete experiences of teachers and yogis. Contrary to misconceptions, yoga doesn't clash with any faith but welcomes practitioners of all beliefs, from agnostics to adherents of various religions.

In Sanskrit, "Asana" signifies a physical posture that can be comfortably sustained for extended durations. These postures benefit the body's muscles, joints, cardiovascular and nervous systems, along with the mind, psyche, and chakras. They serve as psychosomatic exercises, balancing the nervous system and stabilizing the practitioner's mental state, inducing feelings of contentment, mental clarity, relaxation, inner freedom, and peace throughout yoga sessions.

The "Yoga in Daily Life" system progresses systematically, guiding practitioners from simpler preparatory exercises toward more challenging Asanas. Intervals for relaxation within the practice deepen the connection with one's body, allowing physical and mental relaxation, which are essential for the proper execution of yoga exercises, revealing the complete effects of the Asanas.

### Yogic Activities

Yogic activities encompass a broad range of practices designed to promote holistic well-being, cultivating harmony between the body, mind, and spirit. Rooted in ancient Indian tradition, yoga is not merely a physical exercise regimen but a comprehensive system focusing on personal transformation and inner balance. Here's an in-depth exploration of various yogic activities:

#### Asanas (Yoga Poses)

Asanas are the physical postures practiced in yoga. They involve adopting specific body positions to enhance flexibility, strength, and balance. Each asana offers unique benefits, targeting various muscle groups, joints, and internal organs. Examples include the warrior poses (Virabhadrasana), downward-facing dog (Adho Mukha Svanasana), and the tree pose (Vrikshasana).

**Pranayama (Breath Control):** Pranayama refers to breathing exercises aimed at regulating and controlling the breath. These practices help in harnessing vital energy (prana) through conscious breathing techniques. Breathing exercises such as Ujjayi

Pranayama (Victorious breath), Kapalabhati (skull-shining breath), and Nadi Shodhana (alternate nostril breathing) help calm the mind, increase oxygenation, and enhance overall well-being.

### **Meditation**

Meditation is a core aspect of yoga, involving mindfulness and focused concentration. It encourages mental clarity, emotional balance, and inner peace. Meditation practices vary, including guided visualization, mindfulness meditation, loving-kindness meditation (Metta), or transcendental meditation (TM). Regular meditation cultivates self-awareness, reduces stress, and fosters a sense of tranquility.

### **Yoga Nidra (Yogic Sleep)**

Yoga Nidra is a relaxation practice that induces deep relaxation while maintaining consciousness. Practitioners lie down in a comfortable position and follow guided instructions, leading them through a systematic relaxation of body parts and a journey within. Yoga Nidra promotes relaxation, reduces tension, and fosters mental rejuvenation.

### **Yamas and Niyamas (Ethical Principles)**

Yamas and Niyamas are ethical guidelines or moral principles in yoga. Yamas encompass moral disciplines such as non-violence (Ahimsa), truthfulness (Satya), non-stealing (Asteya), non-excess (Brahmacharya), and non-greed (Aparigraha). Niyamas involve personal observances, including purity (Saucha), contentment (Santosha), self-discipline (Tapas), self-study (Svadhya), and surrender to a higher power (Ishvara Pranidhana). These principles serve as foundational pillars for ethical living and self-development.

### **Mantra Chanting**

Mantra chanting involves the repetition of specific sounds, words, or phrases, known as mantras. It's a powerful practice that aids in focusing the mind, invoking positive energy, and fostering a sense of inner harmony. Mantras can be traditional Sanskrit verses or personalized affirmations.

### **Yoga Philosophy and Study**

Understanding the philosophical underpinnings of yoga is essential for a comprehensive practice. Studying ancient texts like the Yoga Sutras of Patanjali, the Bhagavad Gita, or exploring teachings on yoga philosophy elucidates the deeper meaning and purpose behind yogic practices.

### **Yoga Retreats and Workshops**

Yoga retreats and workshops offer immersive experiences, allowing practitioners to deepen their practice in a dedicated environment. These retreats often include intensive yoga sessions, meditation, discussions on yoga philosophy, and opportunities for self-reflection.

### **Yogic Lifestyle and Diet**

Yoga advocates a mindful and balanced lifestyle, including a healthy diet, adequate sleep, and a positive outlook on life. A yogic diet emphasizes whole foods, moderation, and awareness of the impact of food on both body and mind.

### **Yoga Therapy**

Yoga therapy adapts yogic practices to address specific health concerns or conditions. It integrates yoga techniques, including asanas, pranayama, meditation, and relaxation, to promote healing and alleviate physical, mental, or emotional ailments.

### **Community and Seva (Selfless Service)**

Engaging in community-based yoga events, volunteering, or offering yoga classes for underserved populations embodies the yogic principle of Seva. By extending yoga's benefits to others, practitioners contribute to collective well-being.

Yogic activities are diverse and cater to individuals seeking physical fitness, mental clarity, emotional balance, spiritual growth, or a combination of these elements. A holistic approach to yoga encompasses various practices, encouraging practitioners to explore and integrate them into their lives according to their unique needs and aspirations.

### **Aerobic Activities**

The term "aerobics" was coined by Dr. Kenneth H. Cooper, a physician and Director of the Aerospace Medical Laboratory in San Antonio, Texas, known for his work with the National Aeronautics and Space Administration (NASA) in preparing astronauts for space missions. Dr. Cooper, an avid exercise enthusiast, observed that despite possessing strong muscles, some individuals struggled with endurance activities like long-distance

running, swimming, and cycling. Consequently, he devised fitness tests, including the 12-minute and 1.5-mile assessments, and the Aerobics Point System. These methods are now utilized worldwide by military organizations, sports teams, law enforcement agencies, as well as numerous schools and universities. Dr. Cooper's influential book, "Aerobics", introduced scientifically formulated exercise programs involving running, walking, swimming, and cycling. His research laid the foundation for most contemporary aerobics programs, predominantly centered around oxygen-consumption equivalency. Two years after the book's release, Dr. Cooper left the U.S. Air Force to delve full-time into exploring the correlation between cardiovascular fitness, health, and longevity.

In 1968, a year after the publication of "Aerobics," Jacki Sorensen, a dancer and creator of Aerobics dancing, was approached to develop a fitness television program for Air Force spouses stationed in Puerto Rico, where her husband, Neil, was posted. Drawing from her own fitness regimen, she pioneered the fusion of dance with aerobic exercise for the program. Designing vigorous dance routines set to lively music gave birth to Aerobic Dancing!

Aerobic fitness stands as a vital component in a comprehensive lifetime fitness program aimed at 'Total wellbeing.' Understanding the fundamental principles of aerobic fitness and engaging in training to enhance it empowers individuals to efficiently and knowledgeably direct their fitness endeavors. The pursuit of "total wellbeing" encompasses achieving balance across all aspects of life, with aerobic fitness serving as the foundational springboard towards this noble pursuit.

Partaking in any form of aerobics demands basic coordination, providing an enjoyable method of exercise while serving as a great source of motivation. Initiating a program with 20 minutes of aerobic activity, at least thrice a week, significantly improves fitness levels. To attain a training effect, one must exercise at a pace inducing heavy breathing and a considerably accelerated heart rate. Commencing at a low intensity and gradually increasing it over subsequent weeks is crucial. For instance, initially, 20 minutes of walking, jogging, or a mix of both might leave one breathless and fatigued. However, as weeks progress, increasing the pace or incorporating light hill jogging may further boost fitness levels. To continue enhancing fitness, exercising aerobically for up to 30 minutes per session, five times a week, becomes necessary.

Maintaining variety in exercise types, intensities, and durations is imperative. Sticking to the same routine can quickly become monotonous and hinder achieving comprehensive fitness.

While a warm-up isn't essential before gentle jogging or cycling, the post-activity 'cool down' period presents the ideal time for stretching to enhance flexibility. Various exercise programs available include:

- **Low Impact Exercises:** These exercises, like floor aerobics, are gentle on the joints and include activities such as brisk walking, step exercises, and aqua aerobics. They aim to burn fat and build aerobic strength without exerting excessive pressure on the joints. These sessions usually feature a warm-up followed by 20-40 minutes of low-impact aerobic workout, tailored to the class's proficiency level. The workout concludes with a cool-down session, often incorporating body conditioning exercises like abdominal workouts.
- **High Impact Aerobics:** These exercises, explained in floor aerobics, involve actions that lift both feet off the floor, leading to increased joint stress upon landing. Examples include jogging or repetitive jumping.
- **Non-Impact Exercises:** These exercises impose no harm on the joints or body systems and encompass slide aerobics and certain aerobic dance forms.
- **Non-Weight Bearing Exercises:** Activities like swimming, rowing, cycling, deep water running, cross-country skiing, stair stepping, jumping rope, and aerobic dancing fall under this category. They don't subject the body to additional weight pressure.
- **Body Sculpting:** This includes light weightlifting and resistance training using elastic bands, exercubes (dynabands), exercise balls, etc., aiding in strength building, muscle toning, and preserving bone density.

### Objectives of the Study

The primary aim of this study was to ascertain the impact of both yogic exercises and aerobic exercise training on anxiety levels among secondary school students. The study set forth hypotheses to explore the anticipated effects, identified limitations, and meticulously detailed the methodology employed for this research.

### Hypotheses

The study's core objective centered around evaluating the influence of yogic exercises and aerobic training on reducing anxiety levels in secondary schoolchildren. The hypotheses formulated were two-fold. First, it hypothesized that both yogic exercises and aerobic training would result in decreased anxiety levels among the participants. Second, the hypothesis suggested that the effect of yogic exercise training might be superior to aerobic exercise training in alleviating specific psychological variables related to anxiety in secondary schoolchildren.

### Limitations

Acknowledging the constraints inherent in the study, the researchers highlighted the inability to control changing climatic conditions during both the training and testing periods. Variations in temperature, atmospheric pressure, and humidity might have impacted the study's outcomes, a factor recognized as a significant limitation.

## Methodology

The methodology involved a comprehensive approach, encompassing subject selection, experimental design, variable identification, test selection, data collection, and statistical analysis. The study involved secondary schoolchildren aged between 14 to 16 years from Kendriya Vidyalaya, Ambajhari, Nagpur, Maharashtra. Extensive review of scientific literature from diverse sources such as books, journals, and research papers was undertaken to establish the relevance of yogic exercises and aerobic training on specific psychological variables associated with anxiety. The collected data underwent rigorous statistical analysis employing analysis of covariance to discern significant mean differences among the groups.

## Findings

The study's outcomes unveiled that yoga training significantly contributed to the reduction of anxiety levels among the participants. Utilizing a questionnaire developed by Dr. Pallavi Bhatnagar, the research deduced that both yogic exercises and aerobic exercises exerted a significant impact on the psychological variables under scrutiny among secondary schoolchildren.

## Analysis

A detailed analysis, presented in Table 1, demonstrated the mean scores and standard deviations of pre-tests for yogic exercises, aerobic exercises, and the control group of secondary schoolchildren. The computed "F" ratio, evaluated at a 5% level of significance, indicated a value ( $F = 0.8262$ ) lower than the critical table value ( $F = 4.08$ ). Consequently, the study accepted the null hypothesis, suggesting that anxiety levels among the three groups—yogic exercises, aerobic exercises, and the control group—exhibited striking similarities.

**Table 1:** Analysis of Covariance for Pre-test and Post-test on Anxiety of Yogic Exercises, Aerobic Exercises, and Control Group of Secondary Schoolchildren

Type of test	Yogic Exercises	Aerobic Exercises	Control Group	Source of Variance	Sum of The Squares	Df	Mean Square	F-ratio
Pre-test mean	14.5400	14.9200	14.2800	Between	10.360	2	5.180	.826
SD	2.266067	2.80553	2.41627	Within	922.180	147	6.273	
Post-test mean	9.1600	13.4200	12.4000	Between	494.760	2	247.380	60.710
SD	1.77695	2.48333	1.70234	Within	598.900	147	4.074	
Adjusted post-test means	8.807	13.179	12.119	Between	89.053	2	8.096	5.036
SD	1.236	2.587	2.124	Within	509.847	144	3.749	

\*Significance at  $\alpha = 0.05$  table value  $= 4.08$

Furthermore, the analysis reveals the post-test mean scores denoting anxiety levels among participants engaged in yogic exercises, aerobic exercises, and those in the control group of secondary schoolchildren. Notably, the mean scores obtained after the tests for yogic exercises, aerobic exercises, and the control group were recorded as 9.1600, 13.4200, and 12.4000, respectively. Correspondingly, their standard deviations were calculated as 1.77695, 2.48333, and 1.70234, respectively.

Upon scrutiny, the computed "F" ratio value, established at a significance level of 5%, demonstrated a result of ( $F = 60.740$ ) which surpassed the critical table value ( $F = 4.08$ ). Consequently, the null hypothesis was decisively rejected, indicating marked disparities in anxiety levels among the three groups—those engaged in yogic exercises, aerobic exercises, and the control group. This discrepancy showcased notably lower anxiety levels among participants involved in both yogic and aerobic exercises compared to the control group.

Subsequently, when examining the adjusted post-test mean scores related to anxiety among the groups—yogic exercises, aerobic exercises, and the control group—the findings showcased values of 8.807, 13.179, and 12.119, respectively. Notably, their corresponding standard deviations were calculated as 1.236, 2.587, and 2.124, respectively.

Evaluating this data, the derived "F" ratio value, obtained at a 5% significance level, exhibited a result of ( $F = 5.036$ ), surpassing the table value ( $F = 4.08$ ). Hence, in this instance, the null hypothesis was discarded, while the alternative hypothesis was accepted. This outcome solidifies the conclusion that significant differences exist between the impacts of yogic exercises and aerobic exercises concerning anxiety levels among secondary schoolchildren.

## Conclusion

In conclusion, based on the study's comprehensive findings, it is unequivocally established that both yogic exercises and aerobic exercises induce a notable reduction in anxiety levels among secondary schoolchildren. However, a comparative analysis reveals that aerobic training tends to be more effective in alleviating anxiety when contrasted with yogic exercises.

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