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THE EFFECT OF MEDITATION ON PHYSIOLOGICAL PARAMETERS

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ABSTRACT

Meditation is one of the most ancient practices for self-realization, stress reduction, and mind-body integration. This study examines the effect of meditation on selected physiological parameters—blood pressure and pulse rate—among postgraduate students in physical education. Thirty male students, aged 21–25 years, were randomly divided into a control and an experimental group. The experimental group practiced meditation for one month (one hour daily) while the control group followed their routine. Data were collected using a stethoscope and sphygmomanometer and analysed through the *t*-test. Findings revealed a significant reduction in pulse rate in the experimental group compared with the control group, indicating improved autonomic balance and relaxation response. Blood pressure also showed a downward trend, though not statistically significant. These results highlight the physiological benefits of meditation, reinforcing its application in physical education, stress management, and lifestyle modification.

KEYWORDS: Meditation, Pulse rate, Blood pressure, Physiological parameters, Yoga, Relaxation response.

1. INTRODUCTION

1.1 Background

The practice of meditation has its origins in India and is rooted in the philosophical systems of Yoga and Vedanta. Yoga is described as a complete science of life, encompassing body, mind, and spirit. For thousands of years, yogis and sages have used meditation to achieve higher levels of consciousness, balance, and health. Ancient texts such as the *Bhagavad Gita* and *Patanjali's Yoga Sutras* emphasize meditation (Dhyana) as a central practice for self-realization and liberation.

From a physiological perspective, meditation induces what is often described as the “relaxation response” (Benson, 1975), which is the counterpart of the “fight or flight” stress response. This state of relaxation involves decreased heart rate, lowered blood pressure, reduced oxygen consumption, and improved metabolic efficiency.

1.2 Meditation and Health

Contemporary research demonstrates that meditation can influence both psychological and physiological processes. Studies have shown its effectiveness in reducing anxiety, depression, and perceived stress (Davidson et al., 2003). Physiologically, meditation has been linked to improved cardiovascular health, reduction in cortisol levels, enhanced immune function, and better autonomic regulation (Cahn & Polich, 2006).

Blood pressure and pulse rate are critical indicators of cardiovascular health. Both parameters are sensitive to stress, anxiety, and lifestyle factors. Regular practice of meditation has been hypothesized to stabilize these parameters by reducing sympathetic nervous system activity and enhancing parasympathetic dominance.

1.3 Rationale of the Study

While numerous studies have examined meditation's benefits, there remains a need to evaluate its specific impact on young, physically active individuals such as postgraduate students of physical education. These students often face physical exertion, competitive stress, and academic challenges, all of which can influence cardiovascular responses. This study aims to fill this gap by systematically evaluating the effect of meditation on pulse rate and blood pressure among this population.

2. REVIEW OF LITERATURE

Several scholars and researchers have explored meditation's influence on health and physiology:

- **Wallace et al. (1971)** demonstrated that meditation significantly reduces oxygen consumption, heart rate, and blood pressure, suggesting a deep physiological rest state.
- **Benson (1975)** introduced the concept of the "relaxation response," describing meditation as a scientifically validated method for counteracting stress-induced autonomic hyperactivity.
- **Cahn & Polich (2006)** reviewed meditation research and concluded that both concentrative and mindfulness practices modulate brain activity, autonomic function, and emotional regulation.
- **Telles et al. (1995)** found that yogic meditation reduces basal metabolic rate and promotes parasympathetic dominance.
- **Sharma et al. (2013)** reported a significant reduction in systolic and diastolic blood pressure among hypertensive patients practicing meditation.
- **Newberg & Iversen (2003)** explained the neurological mechanisms of meditation, showing changes in brain regions responsible for attention, awareness, and autonomic regulation.

Collectively, these studies suggest that meditation exerts measurable physiological effects beneficial for cardiovascular and psychological health. However, research focusing specifically on young, physically trained populations remains limited, warranting the present investigation.

3. Objectives of the Study

1. To measure the physiological parameters (blood pressure and pulse rate) of postgraduate physical education students.
2. To design and implement a meditation program based on these parameters.
3. To study the effectiveness of the meditation program on blood pressure and pulse rate.

4. METHODOLOGY

4.1 Sample

The study population included male students from Chandrashekhar Agashe College of Physical Education (CACPE), Pune, who had participated in intercollegiate competitions.

Thirty students aged 21–25 years were selected using stratified random sampling. They were divided into two groups of 15 participants each:

- **Experimental Group:** Received meditation training.
- **Control Group:** Continued with routine activities, without meditation.

4.2 Tools for Data Collection

- **Pulse Rate:** Measured using a stethoscope (beats per minute).
- **Blood Pressure:** Measured using a sphygmomanometer (mmHg).

4.3 Meditation Tools

The following supportive tools were used to enhance meditation practice:

1. Om chanting
2. Incense
3. Candle or oil lamp
4. Fresh flowers
5. Mantras

4.4 Research Design

A **pre-test post-test equivalent group design** was adopted.

- **Independent Variable:** Meditation
- **Dependent Variables:** Pulse rate and blood pressure

4.5 Procedure

The experimental group followed a structured meditation program daily for **1 hour over 30 days**.

Step	Activity	Duration
1	Prayer (Padmasana)	2 min
2	Breathing concentration	1 min
3	Ear concentration	2 min
4	Breathing concentration	3 min
5	Ear concentration	3 min
6	Lie down (relaxation)	30 min
7	Open & close eyes	5 min
8	Open eyes slowly	4 min
9	Padmasana (final position)	5 min

Prayer used in sessions

“Sahana vavatu, sahanau bhunaktu, sahaviryam karavavahai,

Tejasvinavadhitamastu ma vidvishavahai, Om Shanti Shanti Shanti."

5. RESULTS

5.1 Pre-Test Pulse Rate

Group	N	Mean	Std. Deviation
Control	15	69.87	8.53
Experimental	15	68.73	7.01

The difference was statistically non-significant ($t = 0.397$, $p = 0.694$).

5.2 Post-Test Change in Pulse Rate

Group	N	Mean	Std. Deviation
Control	15	-0.13	6.52
Experimental	15	-5.00	3.40

The difference between groups was significant ($t = 2.562$, $p = 0.016$).

5.3 Interpretation

The experimental group showed a significant reduction in pulse rate after meditation, whereas the control group remained unchanged. Blood pressure values showed minor reductions in the experimental group but were not statistically significant.

6. DISCUSSION

The present study demonstrates that meditation has a positive effect on physiological parameters, particularly pulse rate. These findings are consistent with earlier studies (Wallace, 1971; Benson, 1975; Telles, 1995), confirming that meditation reduces sympathetic nervous system arousal and enhances parasympathetic activity.

The significant reduction in pulse rate indicates relaxation, stress reduction, and improved autonomic regulation. Although blood pressure did not show significant changes, the downward trend is noteworthy and suggests potential long-term benefits with continued practice. For physical education students and athletes, meditation may serve as a valuable adjunct to training, helping to regulate physiological responses to stress and competition. Meditation can also aid in recovery, focus, and performance enhancement.

Limitations

1. Small sample size (30 participants) limits generalizability.
2. Short duration (1 month) may not capture long-term effects.
3. Only male participants were included.

Future Directions

Future studies should include larger, more diverse samples and longer interventions. Combining meditation with other yogic practices such as pranayama and asanas may yield more comprehensive insights.

7. CONCLUSION

Meditation significantly reduces pulse rate and contributes to improved physiological regulation. While blood pressure did not change significantly, the results suggest that continued meditation practice could benefit cardiovascular health. The study highlights meditation as an effective, low-cost, and accessible tool for stress reduction and health promotion, especially among young, physically active populations.

8. Recommendations

1. Incorporate meditation into physical education curricula and sports training programs.
2. Encourage regular meditation practice for stress management among students and athletes.
3. Conduct long-term studies to evaluate the sustained impact of meditation on cardiovascular and psychological health.
4. Explore meditation's effects on other physiological parameters such as heart rate variability, respiratory rate, and cortisol levels.

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