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Manivannan TA
Ph.D., Research Scholar, Department of Physical Education, Bharathiar University, Coimbatore, Tamil Nadu, India

Dharani S
Ph.D., Research Scholar, Department of Physical Education, Bharathiar University, Coimbatore, Tamil Nadu, India

Dr. STN Rajeswaran
Professor, Department of Physical Education, Bharathiar University, Coimbatore, Tamil Nadu, India

Corresponding Author:
Manivannan TA
Ph.D., Research Scholar, Department of Physical Education, Bharathiar University, Coimbatore, Tamil Nadu, India

Influence of physical activity and meditative techniques on physical fitness variables among college level handball players

Manivannan TA, Dharani S and STN Rajeswaran

Abstract
The purpose of this study was to examine the influence of physical activity combined with meditative techniques on physical fitness variables among college level handball players. It was hypothesized that an eight-week program of physical activity combined with meditative techniques would significantly influence selected Physical fitness variables in people with college level handball players. For this study (N=30) thirty men with PSG college of arts and science college handball players from Coimbatore district, Tamil Nadu, India aged between 18 and 25 years were randomly selected as subjects. A pre-test and post-test random group design, consisting of an experimental group and a control group was used. The subjects were randomly assigned to two groups of 15 each: Group 'A,' which participated in the physical activity combined with meditative techniques, and Group 'B,' which received no training. Muscular strength and endurance was assessed using the sit ups, while Body composition was measured using the skin fold caliper. Data was collected before and after the eight-week training period. The data was analyzed using Analysis of Covariance to assess the influence of physical activity combined with meditative techniques on physical fitness variables among college level handball players. The level of significance was set at 0.05. The results strongly indicated that the eight-week program of physical activity combined with meditative techniques had a significant effect on the selected Physical fitness variables of individuals with college level handball players. Therefore, the hypothesis that physical activity combined with meditative techniques would significantly affect these Physical fitness variables was accepted.

Keywords: Physical activity combined with meditative techniques, muscular strength and endurance and body composition

Introduction

Physical activity

Physical activity is an essential component of a healthy lifestyle, contributing significantly to overall well-being and quality of life. It encompasses any bodily movement produced by skeletal muscles that require energy expenditure. Engaging in regular physical activity is crucial for maintaining physical fitness, preventing various health conditions and enhancing mental and emotional well-being. The importance of physical activity has been widely recognized by health organizations worldwide, including the World Health Organization (WHO) which recommends at least 150 minutes of moderate-intensity aerobic activity per week for adults.

One of the primary benefits of physical activity is its positive impact on cardiovascular health. Regular exercise strengthens the heart, improves blood circulation and helps regulate blood pressure. It reduces the risk of developing cardiovascular diseases such as heart attacks and strokes. Physical activity also plays a significant role in weight management by burning calories and increasing metabolism. It helps prevent obesity a leading cause of numerous chronic diseases, including type 2 diabetes, hypertension and certain types of cancer. Apart from physical health benefits, engaging in regular exercise contributes to improved mental health. Physical activity triggers the release of endorphins which are natural mood boosters that reduce stress, anxiety and depression. Studies have shown that individuals who engage in regular physical exercise experience better cognitive function, improved concentration and

enhanced memory retention. Exercise has also been linked to better sleep patterns, contributing to overall mental and emotional stability.

Physical activity is not limited to structured workouts or gym sessions. It includes various forms of movement such as walking, running, cycling, swimming, yoga and even household chores or gardening. Incorporating physical activity into daily routines can be simple and effective. For example, opting for stairs instead of elevators, walking or cycling to work or engaging in active recreational activities with family and friends can contribute to an active lifestyle.

Meditative techniques

Meditation is an ancient practice that has been utilized for centuries to promote mental clarity, emotional stability and overall well-being. Meditative techniques involve focusing the mind, eliminating distractions and cultivating mindfulness to achieve a deep state of relaxation and awareness. Various forms of meditation exist across different cultures and traditions with each offering unique benefits to practitioners. Over the years, extensive research has been conducted to understand the physiological and psychological impacts of meditation, making it a widely accepted method for improving mental and physical health.

According to Kabat-Zinn (1990), mindfulness meditation, a widely recognized meditative technique, emphasizes present-moment awareness without judgment. This technique involves paying close attention to thoughts, emotions and bodily sensations while maintaining a state of acceptance. Mindfulness meditation has gained popularity due to its effectiveness in reducing stress, anxiety and depression. Studies have demonstrated that regular mindfulness practice enhances cognitive function, improves emotional regulation and fosters overall psychological resilience. Transcendental Meditation (TM) introduced by Maharishi Mahesh Yogi in the 1950 is another popular technique known for its simplicity and effectiveness (Mahesh Yogi, 1958). TM involves silently repeating a specific mantra to achieve a state of deep relaxation and heightened awareness. Research has shown that TM helps lower blood pressure, reduce cortisol levels and improve cardiovascular health. Practitioners often report experiencing a sense of inner peace and improved concentration as a result of regular practice.

Zen meditation or Zazen, is a meditative technique deeply rooted in Buddhist traditions (Suzuki, 1970). It involves seated meditation with a focus on breath control and posture. Practitioners aim to cultivate insight and self-discipline by observing thoughts without attachment. Zen meditation has been associated with enhanced mindfulness, emotional stability and increased self-awareness. It is widely practiced in monasteries and meditation centers worldwide, reflecting its enduring significance in spiritual and personal development.

Physical activity combined with meditative techniques

The combination of physical activity and meditative techniques is an emerging approach to enhancing overall well-being. This integrated practice offers a holistic approach to health by fostering both physical fitness and mental clarity. While physical activity is widely recognized for its benefits in improving cardiovascular health, muscular strength and overall endurance, meditation is renowned for reducing stress, enhancing focus and promoting emotional stability. Merging these two disciplines creates a synergy that amplifies their individual benefits, making them a powerful tool for achieving physical and psychological balance.

Physical activity, including exercises such as yoga, tai chi and mindful walking, engages the body in movement while also encouraging deep concentration and controlled breathing. Yoga for instance, is a prime example of a practice that seamlessly integrates meditation and physical movement. Originating from ancient India, yoga consists of postures (asanas), breathing techniques (pranayama) and meditation (dhyana) that work together to improve flexibility, balance and mental relaxation. Scientific studies have shown that practicing yoga consistently can lead to lower blood pressure, reduced anxiety and enhanced physical endurance. Tai chi, another widely practiced form of mindful movement, originates from traditional Chinese medicine and combines slow, flowing physical movements with meditative awareness. Tai chi is often referred to as “meditation in motion” due to its emphasis on maintaining a calm mind while performing controlled movements. Research suggests that tai chi enhances muscle coordination, reduces stress and improves cognitive function, making it particularly beneficial for individuals of all ages, including the elderly.

Another effective way of combining physical activity with meditation is through mindful walking, where individuals focus on their breath and bodily sensations while walking at a steady pace. This practice encourages mindfulness, enhances physical stamina and promotes a sense of presence. Studies have indicated that mindful walking helps reduce symptoms of depression and improves overall mental clarity. The physiological benefits of combining physical activity with meditative techniques are well-documented. Regular engagement in such practices has been found to lower cortisol levels which are associated with stress, while simultaneously enhancing endorphin production which contributes to feelings of well-being and relaxation. Additionally, these practices improve the body's autonomic nervous system function, leading to better emotional regulation and resilience against mental fatigue.

Methodology

The aim of this study was to examine the influence of physical activity combined with meditative techniques on physical fitness variables among college level handball players. It was hypothesized that an eight-week program of physical activity combined with meditative techniques would significantly influence selected Physical fitness variables in people with college level handball players. The study involved (N=30) thirty men from Coimbatore district, Tamil Nadu, India aged between 18 and 25 years who were randomly selected as participants. A pretest-posttest random group design, consisting of an experimental group and a control group was used. The participants were randomly assigned to two equal groups of 15 each: Group ‘A’ which participated in the physical activity combined with meditative techniques program and Group ‘B’ which received no training. Muscular strength and endurance was assessed using the sit ups, while Body composition was measured using the skin fold caliper data was collected before and after the eight-week training period. The data was analyzed using Analysis of Covariance to determine the influence of physical activity combined with meditative techniques on the selected physical fitness variables in individuals with college level handball players. The level of significance was set at 0.05.

Results

Table 1: Descriptive statistics of pre- and post-test scores for selected variables in the physical activity combined with meditative techniques group and control group

Group	Variables	Pre-test mean	Post-test mean	Adjusted mean
Yogic practices group	Muscular strength and endurance	53.74	42.45	42.13
	Body composition	14.44	11.16	11.06
Control group	Muscular strength and endurance	54.12	54.03	54.04
	Body composition	15.14	15.09	15.11

*Significant at 0.05 level

Table 2: Calculation of analysis of variance for initial and final means of selected physical fitness variables

Variables		Sources	SS	df	MS	F-ratio
Anxiety	Pre Test	Between sets	1.20	1	1.20	0.24
		Within sets	136.66	28	4.88	
	Post Test	Between sets	1092.03	1	1092.03	102.97*
		Within sets	296.93	28	10.60	
Aggression	Pre Test	Between sets	0.83	1	0.83	0.28
		Within sets	81.46	28	2.91	
	Post Test	Between sets	104.53	1	104.53	30.70*
		Within sets	95.33	28	3.40	

*Significant at 0.05 level

In the initial data analysis, an F-test was applied to compare the initial and final means between the physical activity combined with meditative techniques Group (PACMTG) and the Control Group (CG) on Physical fitness variables. The critical F-value for significance with 1 degree of freedom (df) and 28 degrees of freedom at the 0.05 level was 4.19. The obtained F-values for the initial means of Muscular strength and endurance (0.24) and body composition (0.28) were found to be non-significant. These values did not meet the required table value of 4.19 for df 1 and 28, indicating that the mean differences between the PACMTG and CG on these variables before the treatment were statistically insignificant.

For the final means, the observed F-values for Muscular strength and endurance (102.97) and Body composition (30.70) were compared to the critical value of 4.19 at the 0.05 significance level. The observed F-values for Muscular strength and endurance and body composition were greater than the required table value of 4.19 for df 1 and 28. Consequently, it was concluded that the mean differences between the PACMTG and CG on the final means for anxiety and aggression were statistically significant.

Table 3: Analysis of Covariance on Muscular strength and endurance

Sources of variance	Sum of squares	DF	Mean square	F-ratio
Between sets	1087.75	1	1087.75	99.15*
Within sets	296.21	27	10.97	

*Significant at 0.05 level

Table - 3 shows that the obtained F-value was significant at the 0.05 level with 1 and 27 degrees of freedom, where the required table value was 4.21. Since the observed F-value (99.15) was greater than the table value (4.21), it was concluded that the adjusted mean difference between the PACMTG and CG was statistically significant.

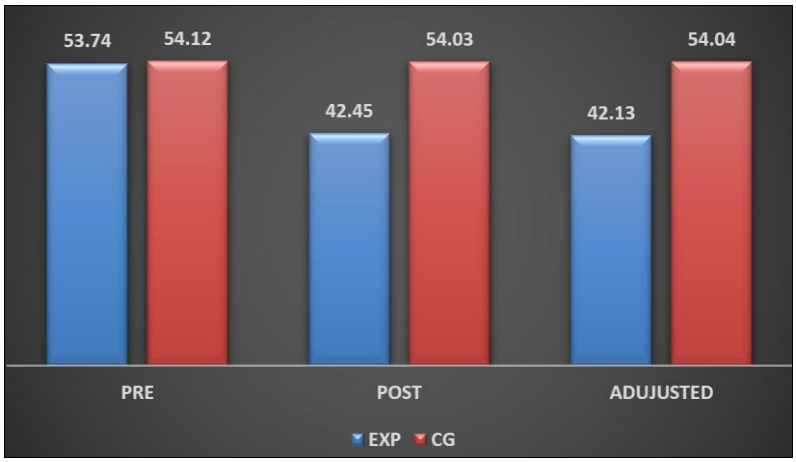

Fig 1: The table presents the adjusted post-test mean values for Muscular strength and endurance in the physical activity combined with meditative techniques Group (PACMTG) and the Control Group (CG)

Table 4: Analysis of covariance on body composition

Sources of variance	Sum of squares	Df	Mean square	F-ratio
Between sets	106.15	1	106.15	30.60*
Within sets	93.64	27	3.46	

*Significant at 0.05 level

Table - 4 reveals that the obtained 'f' value was, to be significant at 0.05 level for degree of freedom 1 and 27, the required table value was 4.21. Hence, observed 'f' value (30.60) was found as greater than the table value (4.21), it was

inferred that the adjusted mean difference existing between the PACMTG and CG on was statistically significant.

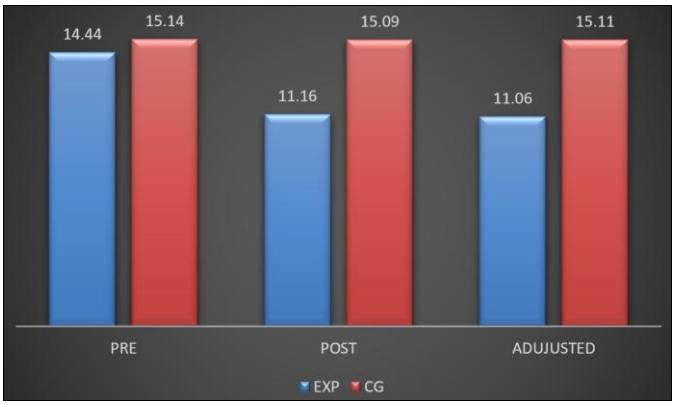

Fig 2: Shows the adjusted post-test mean values of Physical Activity Combined with Meditative Techniques Group (PACMTG) and Control Group (CG) on Body composition

Finding of results

The results for Physical fitness variables showed a significantly greater improvement in the experimental group compared to the control group from pre-test to post-test (8 weeks). This improvement can be attributed to the regular practice of physical activity combined with meditative techniques which may have led to a notable increase in physical fitness variables among individuals with college level handball players. The findings of this study strongly suggest that an eight-week regimen of physical activity combined with meditative techniques has a significant effect on the selected Physical fitness variables.

Conclusions

Within the limitation of the present study, the conclusions were drawn.

1. The physical activity combined with meditative techniques had shown significant difference in all the selected Physical fitness variables among college level handball players.
2. The experimental group had shown significant improvement in all the selected Physical fitness variables than the control group.

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