Effects of Yogic Practices and Walking on Leg Explosive Strength among School Boys

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Abstract

The aim of the present study was to find out the isolated and combined effects of yoga exercise and running on leg explosive strength in high school boys. Sixty (n=60) boys of Asannagar High School in Nadia district of West Bengal were randomly selected as subjects, their age ranged from 14 to 16 years. The selected subjects were randomly divided into four groups of 15 participants each. Group 1 served as yogic exercise group, group 2 as walking group, group 3 as combined walking and yoga group, and group 4 as control group. Before and after exercise, the subjects underwent a pre- and post–test that measured leg explosive strength by performing a double-legged standing long jump. The researcher evaluated before and after the six-week training period. Analysis of covariance (ANCOVA) was used to find out the significant differences between the experimental group and the control group on selected criterion variables, and Scheffe's test was applied as a post hoc test to determine which of the paired means showed significant differences. It was found that the group that combined walking and yoga practices was significantly better than the group with yoga practices and the group with walking and control in terms of improvement in leg explosive strength. It was found that the group with yogic practices was significantly better than the control group in improving the explosive strength of the legs. It was found that walking group was significantly better than control group in explosive strength of legs. It was concluded that the yogic exercise group was significantly better than the walking group in improving the explosive strength of the legs as measured by the ability of the explosive strength of the legs in school boys.

KEY WORDS: Yoga, walking, motor fitness components, leg explosive strength.

INTRODUCTION

Yoga is a systematic discipline originating from India. It highlights that the goal of yoga practice is to achieve a deeper connection with the divine or supreme soul. Yoga is presented as a holistic practice that has the potential to address both physical and psychological issues. It is said to activate the body's organs, positively affecting internal bodily functions and mental processes.Yogais not just a physical exercise but also a mental and spiritual practice that promotes intellectual and spiritual development. It is described as a "non-violent activity," suggesting a gentle and mindful approach to improving one's overall well-being(Sharma, 1984).Several studies and researchers are mentioned throughout the previous discussion to support the beneficial effects of yoga on various aspects of health. These benefits include improved physical fitness, reduced blood pressure, lowered cholesterol, enhanced joint flexibility, and even a decreased risk of falling among older individuals. Even a few minutes of daily yoga practice can contribute to overall development.The concept of "Motor Fitness Component" is introduced, referring to the dynamic physiological

state of an individual, encompassing strength, cardiovascular endurance, speed, agility, strength, flexibility, balance, and coordination. This concept aligns with the idea that various components of fitness contribute to a person's overall physical well-being.A firm amount of muscular strength is precondition for any short of human movement (Thomas and Roger, 2008) as the body lever is made up of mainly bones and muscles. The force for functioning of this lever is generated by none other than muscles involved in that particular movement. Owing to these reasons strength is one of the most contributing factors for success in sport involving high level of competition. Most of the sporting movements demanding immediate and powerful force production, utilizes the lower limbs for the purpose (Mondal et al., 2014). Fitness is emphasized as a crucial aspect of a healthy lifestyle, and the raising awareness about the importance of fitness in the community is vital.The physically fit child feels more alert and eager to do things. A weak child is a weak brick in the wall of the country (Ghosh and Mondal, 2016).The physical exercises (*asanas*) may increase patient's physical flexibility, coordination, and strength, while the breathing practices and meditation may calm and focus the mind to develop greater awareness and diminish anxiety(Kirkwood G et al., 2005). Yoga, one of the mind-body complementary/ alternative therapies, is a low impact exercise that focuses not only on physical training but also on developing one's mind and spirit (Colette et al. 2000).

Aim of the study is to investigate the isolated and combined effects of yogic practices and walking on leg explosive strength among school boys.

Materials and Methods

Sample:

This study is confined to Asannagar High School in Nadia district of West Bengal. Sixty (n=60) male students were randomly selected as subjects with the age group of 14 to 16 years randomly grouped as sample. The study was limited to 15 boys in each group. Subjects willing to participate in this study will be enrolled regardless of their community.

Parameter:

Explosive strength:The jump was performed by the subjects using with both legs, landing on both feet. The distance from the starting line to the heel of the farthest foot after landing was measured in cm. The better of two jumps was used for analysis.

Research design:

The study was formulated as a true random group design, consisting of a pre-test and post-test. Subjects (n=60) were randomly assigned to four equal homogeneous groups of 15 boys each. Among the four groups, the control group was under strict observation and was not subjected to any special activity. The experimental groups were subjected to the experimental treatments. The groups were designated as experimental groups I, II, III and control group respectively. Pre- tests of leg explosive strength by vertical jump were performed for all the subjects. The experimental groups participated in their respective walking exercises, yogic exercises and combined walking and yogic exercises for a period of six weeks. After six weeks, post- tests were conducted on the above said dependent variable. The training programme was conducted on weekdays (except Sunday) scheduled at 7.00 a.m. to 8.00 a.m.

Yogic Practices:

Yoga encompasses a variety of physical postures (asanas), breathing exercises (pranayama), and meditation techniques. While yoga primarily focuses on flexibility, balance, and mental well-being, certain aspects of yoga could indirectly contribute to

leg explosive strength.

Flexibility:

Improved flexibility gained through yoga can enhance the range of motion around the joints, potentially aiding in better movement patterns and preventing injuries during explosive activities.

Mind-Muscle Connection:

Yoga emphasizes mindfulness and body awareness. This heightened connection between the mind and muscles might enhance neuromuscular coordination, which is essential for explosive movements.

Walking:

Walking is generally considered a low-impact aerobic activity that can improve cardiovascular fitness, endurance, weight management, joint healthand overall health. While walking does engage leg muscles to some extent, it is not typically associated with significant gains in explosive strength. Walking might contribute to general leg strength and endurance, but for improving explosive strength, more intense and targeted exercises like plyometrics and resistance training are often recommended."Walking provides an ideal test of the health benefits of moderate-intensity walking" (Paul and Paul, 2013). Brisk walking means moderate intensity walking. Moderate intensity as being from 50-70% of their maximum heart rate, this varies by age. For school boys, walking can be a foundational activity to promote a healthy lifestyle and maintain a baseline level of leg strength and fitness. However, it might not be sufficient on its own to significantly enhance explosive strength.

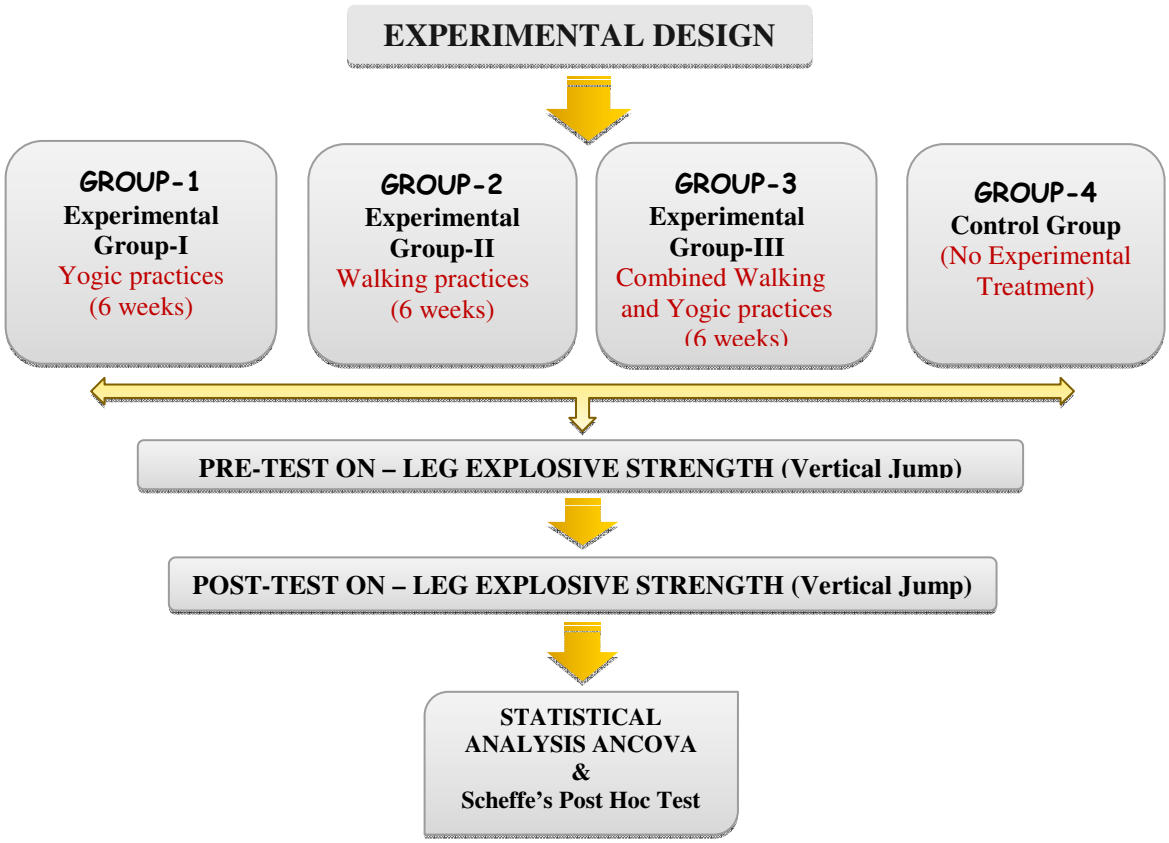
Isolated vs. Combined Effects:

The isolated effects of either yogic practices or walking on leg explosive strength might be relatively limited, especially when compared to more specific resistance training exercises. Explosive strength is typically developed through exercises that involve high-force, high-velocity movements, such as plyometrics, sprinting, and weightlifting.

Combining yogic practices and walking could have some synergistic effects. Yoga could improve flexibility and neuromuscular coordination, while walking could contribute to general leg strength and endurance. These factors might indirectly support explosive strength development by creating a more well-rounded foundation of physical fitness.It is important to note that if the primary goal is to enhance leg explosive strength, incorporating targeted resistance training exercises into the routine is essential. Exercises like squats, lunges, box jumps, and sprints are more likely to have a direct impact on explosive strength due to their nature of engaging fast-twitch muscle fibers and training the energy systems relevant to explosive movements.

Data Processing:

Differences between initial and final values in leg explosion strength were subjected to statistical treatment using analysis of covariance (ANCOVA) to determine whether the mean differences were significant (Verma, 2011). The Scheffe's post-hoc test was used to determine the significance difference of the paired means (Thirumalaisamy, 1998).



RESULTS AND DISCUSSIONS

Results on Leg Explosive Strength

The statistical analysis comparing the initial and final means of Leg explosive strength due to isolated and combined effect of yogic practices and walking on motor fitness variable, Leg explosive strength is presented in Table I.

TABLE I

Analysis of covariance of Leg explosive strength among school boys

(Total Scores in centimetres)

	Yogic	Walking	Combined	Control	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-Test Mean	46.20	48.33	48.93	48.9	Between	74.18	3	24.73	0.46
					Within	3024.40	56	54.01	
Post- Test Mean	54.20	52.40	51.93	48.5	Between	258.58	3	86.19	1.60
					Within	3024.67	56	54.01	
Adjusted Post Test Mean	56.04	52.16	51.10	47.7	Between	520.12	3	173.37	64.14*
					Within	148.67	55	2.70	
Mean Diff	8.00	4.07	3.00	-0.40					

*Significant at 0.05 level

Table F-ratio at 0.05 level of confidence for 3 and 56 (df) =2.77, 2 and 55(df) =2.77.

As shown in Table I, the obtained F value on the scores of pre-test means 0.46

was less than the required F value, which proved that the random assignment of the subjects were successful and their scores in Leg explosive strength before the training were equal and there was no significant differences.

The obtained F value on the scores of post-test means 1.60 was lesser than the required F value 2.77.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 64.14 was greater than the required value of 2.77 and hence it was accepted that the yogic practices, walking exercises and combination of yogic practices and walking training, significantly improved Leg explosive strength of the subjects.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table II.

Table II

Scheffe's Confidence Interval Test Scores on leg explosive strength among school boys

(Scores in centimeters)

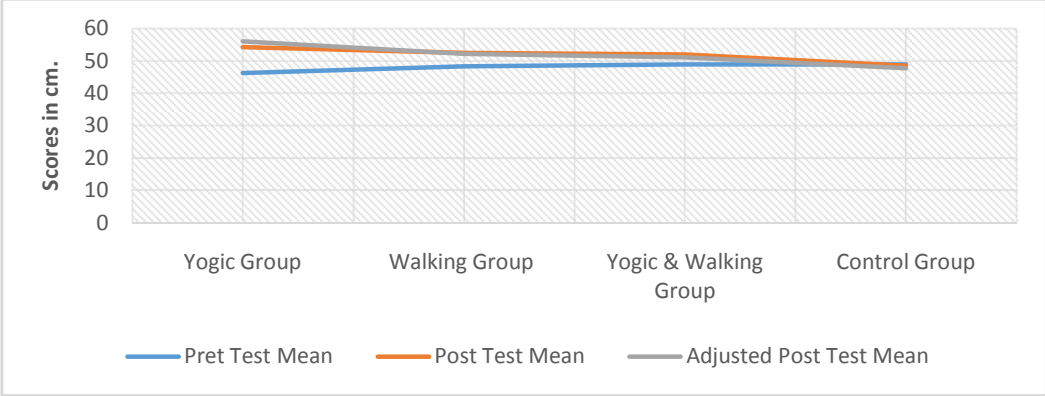
MEANS				Mean Difference	Required C I
Yogic Practices	Walking	Combined	Control		
56.0	52.2			3.9*	1.7
56.0		51.1		4.9*	1.7
56.0			47.7	8.3*	1.7
	52.2	51.1		1.1	1.7
	52.2		47.7	4.5*	1.7
		51.1	47.7	3.4*	1.7

*Significant at 0.05 level

The ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure I.

Figure I

Line graph on ordered adjusted Means of Leg Explosive Strength



Discussion on the Results of Leg Explosive Strength

Table II shows the post hoc analysis of obtained ordered adjusted means of the yogic, walking, and combined and control group. From the results presented in Tables I and II it was proved that the interventional programme yogic practices, walking and combination of yogic and walking practices significantly improved Leg explosive strength of the school boys.

Analysis of adjusted means through Scheffe's post hoc test proved that there were significant differences existed between yogic group and walking group, yogic group and combined group, yogic group and control group, walking group and control group, combined group and control group. This proved that due to six weeks training on yogic, walking, and combined groups significantly improved Leg explosive strength comparing to control group.

There were no significant differences between walking group and combined group.

It was also proved that yogic group was better than combined, walking and control group in improving the Leg explosive strength of the subjects.

CONCLUSION

1. The intervention programs involving yogic practices, walking, and the combination of both significantly improved the leg explosive strength of the school boys. This improvement is evident from the analysis of adjusted means presented in Tables I and II.
2.The Scheffe's post hoc test revealed significant differences between various groups: yogic group vs. walking group, yogic group vs. combined group, yogic group vs. control group, walking group vs. control group, and combined group vs. control group. This suggests that all intervention groups (yogic, walking, and combined) exhibited significantly improved leg explosive strength compared to the control group after the six-week training period.
3. The study concluded that the yogic practices group was significantly better than the combined walking and yogic practices group in terms of improving leg explosive strength as measured through the standing broad jump test.
4. Additionally, the yogic practices group was found to be significantly better than the walking group in enhancing leg explosive strength as measured through the standing broad jump ability among school boys.
5. The yogic practices group also showed significant improvement compared to the control group, further highlighting the positive impact of yogic practices on leg explosive strength among school boys.
The walking practices group demonstrated significant improvement in leg explosive strength compared to the control group, as measured through the standing broad jump.

The study's results indicate that yogic practices, walking, and their combination can lead to significant improvements in leg explosive strength among school boys. The discussion section provides a clear overview of the statistical comparisons and conclusions drawn from the study's findings.

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