

Enhancing Dexterity And Speed Of Movement Through Yogic Practices And Neuromotor Training In Female Students

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ABSTRACT

A proactive mindset among young women fosters resilience and adaptability, equipping them to navigate diverse life challenges with grace and vigor while simultaneously nurturing physical literacy. Within this framework, finger dexterity and motor speed emerge as essential components of fine motor control, reflecting the efficiency of neuromuscular coordination and the ability to execute rapid, precise movements (Telles, Raghuraj, Arankalle, & Naveen, 2014, p. 22). This study aimed to evaluate the effects of yogic practices and neuromotor training on two critical motor skills dexterity and speed of movement among female undergraduate education students.

Forty-eight female students, aged from 22 to 26, enrolled in a college of education (B.Ed), were randomly assigned to one of three groups: the Yogic Practice Group (YPG), the Neuromotor Training Group (NMTG), and the Control Group (CG). While the CG did not participate in any structured intervention, the YPG and NMTG completed six-week training programs. Dexterity was assessed using the Finger Dexterity Task, and speed of movement was measured via the 30-meter sprint test. Pre-test scores were used as covariates in the ANCOVA analysis. The results revealed significant improvements in both dependent variables following the intervention. Dexterity showed greater enhancement in the YPG, whereas speed of movement was notably higher in the NMTG compared to the CG. These findings suggest that yogic practices are more effective in improving dexterity, while neuromotor training yields superior outcomes in enhancing speed of movement among female undergraduate education students.

Keywords: Yogic Practices, Neuro Motor Training, Dexterity & Speed of Movement.

Introduction

Dexterity and speed of movement are foundational psychomotor abilities that underpin effective motor learning, active participation in physical tasks, and the execution of daily functional activities. Dexterity refers to the fine motor precision and coordination of small muscle groups, while speed of movement denotes the rapid execution of voluntary motor actions. Among female undergraduate students particularly those enrolled in teacher education and physical education programs these skills are closely associated with academic performance, physical health, and professional readiness. Prior research has demonstrated that improved dexterity enhances hand-eye coordination and task efficiency, whereas increased movement speed supports quick, adaptive responses in both academic and recreational contexts (Schmidt & Lee, 2014; Telles *et al.*, 2014).

Targeted interventions such as yogic practices and neuromotor training may play a pivotal role in strengthening these psychomotor attributes in young women. Yogic practices, which combine physical postures, controlled breathing, and mindfulness, have been shown to enhance neuromuscular control,

attentional focus, and overall psychomotor functioning (Sengupta, 2012; Tran *et al.*, 2001). Neuromotor training, meanwhile, emphasizes agility, coordination, and proprioceptive awareness through structured movement drills. Despite the individual benefits of both approaches, few studies have examined their comparative effects on dexterity and movement speed among female teacher candidates. Existing literature tends to focus on athletic populations, adolescents, or clinical groups, leaving a gap in understanding within higher education contexts where psychomotor competence contributes directly to teaching effectiveness and professional development.

Purpose of the Study

The present study aimed to investigate the Impact of Yogic practices and Neuromotor Training on Dexterity and Speed of Movement among female undergraduate education students.

Methodology

To achieve the objectives of the study, 48 female undergraduate education students from St. Joseph College of Education located in Vaikalipatti, Tenkasi District, Tamil Nadu, India, were selected as participants. Their ages ranged from 22 to 26. They were randomly divided into three equal groups, each consisting of sixteen participants. For six weeks, Experimental Group I participated in yogic practices, Experimental Group II experienced neuromotor training, while the Control Group received no training. Following a description of the study's intent to every participant, their assistance was requested. The data for the variables Dexterity (Finger Dexterity test) and Speed of Movement (30 Meters Sprint Test) were analyzed using the following statistical methods, Analysis of Covariance and Descriptive Statistics (ANCOVA) to determine the adjusted post-test mean differences among groups at a significance level below 0.05, while accounting for baseline variations

Analysis and Interpretation of Data

The following table shows the results of an analysis of the covariance between the Dexterity of the Yogic Practices Group, Neuromotor Training Group, and Control Group.

Analysis of Covariance on Dexterity of Experimental Groups and Control Group

Adjusted Post Test Means			Source of Variance	Sum of Square	Df	Means Square	F-ratio	Sig
YPG	NMTG	CG						
263.847	274.796	288.660	Between	4802.961	2	2401.480	86.879*	.000
			With in	1216.229	44	8.642		

*Significant at .05 level. The table value required for significance at 0.05 level with df = 2 and 44 is 3.21.

The table illustrates that the post-test mean values for YPG, NMTG, and CG are 263.847, 274.796, and 288.660, respectively. At the 0.05 significance level, the F-ratio value of 86.879 exceeds the table value of 3.21 with degrees of freedom = 2 and 44. The adjusted post-test average scores of the two experimental and control groups show a significant difference, as the F-ratio value exceeds the table value.

The Scheffe's test was applied to assess the paired mean difference as the obtained F-ratio was significant. The results are shown in the following table.

The Scheffe's Test for the Difference Between Paired Means on Dexterity

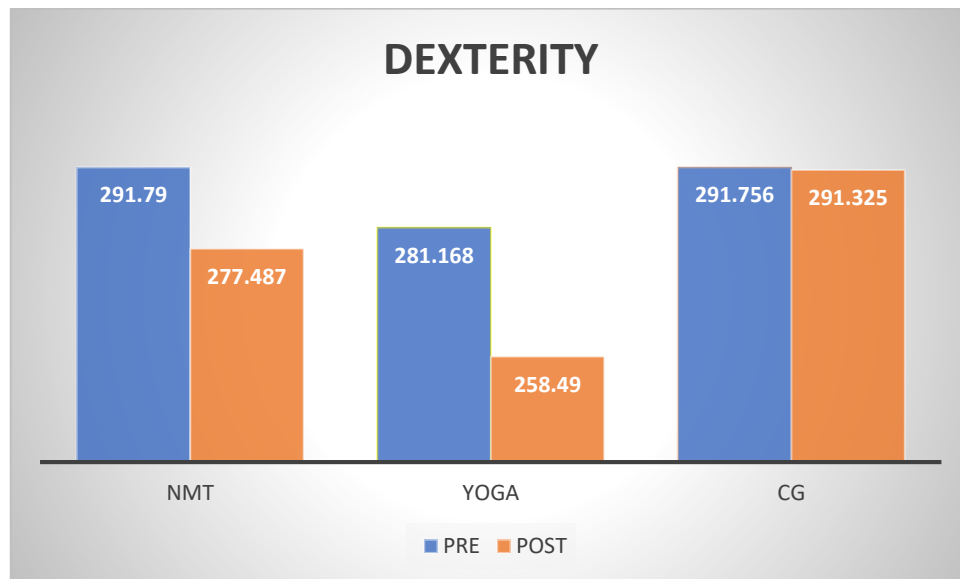
YPG	NMTG	CG	MD	CI
263.847	274.796	-	10.949*	7.83
-	274.796	288.660	13.864*	
263.847	-	288.660	24.812*	

*Significant at 0.05 level of confidence.

Table 2 shows that the mean difference values between YPG & NMTG, NMTG & CG, and YPG & CG are 10.949*, 13.864*, and 24.812* respectively, which are greater than the confidence interval value 7.83 at the 0.05 level of confidence. The results reveal that both Yogic Practices and Neuromotor Training groups showed significant improvement in Dexterity among female undergraduate students. However, the mean value of the Yogic Practices Group indicated greater improvement compared to both the Neuromotor Training Group and the Control Group on Dexterity.

The pre-test, post-test, and adjusted post-test mean values of YPG, NMTG, and CG on Dexterity were graphically represented in the figure.

Pre and Post Test Mean values between YPG, NMTG and CG on Dexterity



The following table shows the results of an analysis of the covariance between the Speed of Movement of the Yogic Practices Group, Neuromotor Training Group, and Control Group.

Analysis of Covariance on Speed of Movement of Experimental Groups and Control Group

Adjusted Post Test Means			Source of Variance	Sum of Square	Df	Means Square	F-ratio	Sig
YPG	NMTG	CG						
6.548	4.178	9.708	Between	83.135	2	41.567	68.069*	.000
			With in	26.869	44	.611		

*Significant at .05 level. The table value required for significance at 0.05 level with df = 2 and 44 is 3.21.

As shown in the table, YPG, NMTG, and CG have adjusted post-test mean values of 6.548, 4.178 and 9.708 respectively. At the 0.05 level of significance, the obtained F-ratio value of 68.069 is greater than the table value of 3.21 with df = 2 and 44. The adjusted post-test mean values of the two experimental and control groups differ significantly, as indicated by the F-ratio value being higher than the table value.

The Scheffe's test was used to determine the paired mean difference because the acquired "F" ratio value was significant. The results are shown in the following table.

The Scheffe's Test for the Difference Between Paired Means on Speed of Movement

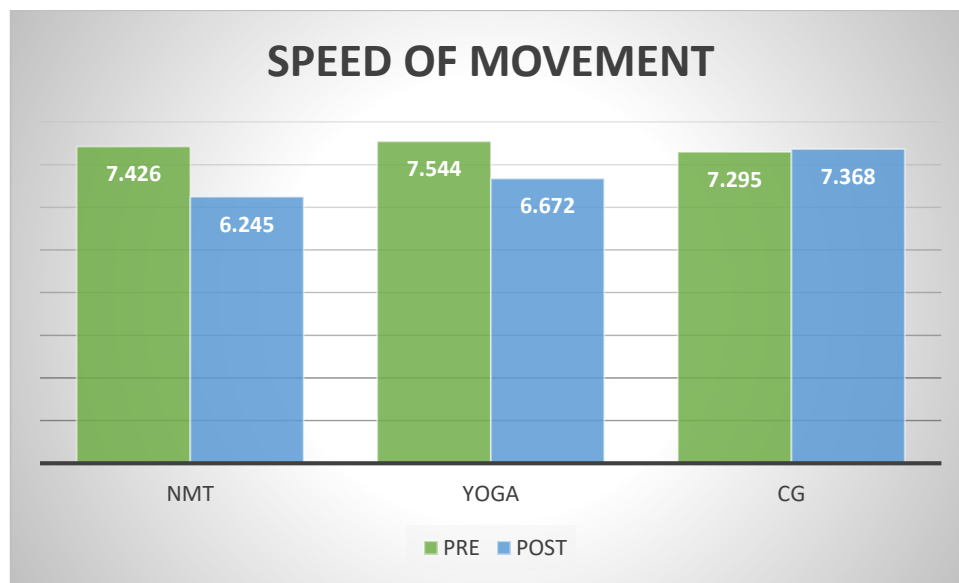
YPG	NMTG	CG	MD	CI
6.548	4.178	-	2.37*	1.86
-	4.178	9.708	5.53*	
6.548	-	9.708	3.16*	

*Significant at 0.05 level of confidence.

The table illustrates that the mean difference values among YPG and NMTG, NMTG and Control Group, and YPG and Control Group are 2.37, 5.53, and 3.16, respectively. These values exceed the 0.05 level of confidence and 1.86 confidence interval. According to the study's findings, Yogic practices and neuromotor training both help female undergraduate education students improve their Speed of Movement. However, the NMTG's mean score on Speed of Movement is higher than the mean scores of the YPG and Control groups.

The illustration displayed a visual depiction of the NMTG, YPG, and CGs' means for pre-test, post-test, and adjusted post-test regarding Speed of Movement

Pre and post Test Mean values between Neuromotor Training Group, Yogic Practices Group and Control Group on Speed of Movement



Discussion on findings

Yogic exercises and meditation have been shown to improve sensory-motor performance, hand-eye coordination, joint flexibility, and finger dexterity, which may help individuals respond more efficiently to both simple and complex situations in daily life. This is supported by the findings of Manisha Dighore & J. V. Gadkari (2013). Similarly, neuromotor training positively influences various aspects of physical fitness including balance, agility, speed, muscular power, and endurance, while enhancing motor muscle performance and activating subcortical control mechanisms, as reported by Saddam Akbar et al. (2022) and Alyson Filipa et al. (2010). The findings of the present study indicate significant differences in the adjusted post-test means of the experimental and control groups on dexterity and speed of movement. The mean values revealed that the Yogic Practices Group (YPG) showed better improvement than the Neuromotor Training Group (NMTG) and Control Group (CG) on dexterity, whereas the NMTG outperformed both YPG and CG in terms of speed of movement.

Conclusion

The results of the study reveal that both Yogic Practices and Neuromotor Training effectively enhanced dexterity and speed of movement among female undergraduate education students aged 22 to 26. However, the Yogic Practices Group demonstrated greater improvement in dexterity, while the Neuromotor Training Group showed superior gains in speed of movement when compared to the other groups.

Reference:

1. Akbar S, Soh KG, Jazaily Mohd Nasiruddin N, Bashir M, Cao S, Soh KL. Effects of neuromuscular training on athletes physical fitness in sports: A systematic review. *Front Physiol.* 2022 Sep 23;13:939042. doi: 10.3389/fphys.2022.939042. PMID: 36213248; PMCID: PMC9540396.
2. Dighore, M., & Gadkari, J. V. (2013). Reducing anxiety: Effect of yogic exercises and meditation in the improvement of anxiety score, visual reaction time and finger dexterity score. *International Journal of Recent Trends in Science and Technology*, 7(1), 52–55.
3. Schmidt, R. A., & Lee, T. D. (2014). *Motor control and learning: A behavioral emphasis* (5th ed.). Human Kinetics.
4. Telles, S., Raghuraj, P., Arankalle, D., & Naveen, K. V. (2014). Immediate effect of yoga breathing on muscle strength and motor speed: A randomized controlled trial. *Indian Journal of Physiology and Pharmacology*, 58(1), 22–29.