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INFLUENCE OF DYNAMIC STABILITY TRAINING ON DYNAMIC AND STATIC BALANCE VARIABLES AMONG COLLEGE MEN BADMINTON PLAYERS

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ABSTRACT

This study explored the influence of dynamic stability training on static and dynamic balance variables among college men badminton players. The importance of balance in badminton is well-established, as players frequently perform rapid movements, directional changes and complex footwork. The aim was to assess how dynamic stability training could enhance both static and dynamic balance, which is critical for performance and injury prevention. Thirty (N-30) male badminton players from various departments of Bharathiar University, Tamil Nadu, were selected as subjects. They were randomly assigned into two groups: an experimental group and a control group, each consisting of fifteen players. The experimental group participated in a structured six-week dynamic stability training program, while the control group did not engage in any additional training during the study period. The training sessions were conducted three times a week, each lasting 60 minutes and consisting of warm-up, core training exercises, dynamic stability drills, and cool-down activities. Static balance was measured using the stroke stand balance test and dynamic balance was assessed through the modified bass test. Data collected before and after the training program were analyzed using the dependent 't' test. The results revealed significant improvements in both static balance ($t=2.15$, $p\leq 0.05$) and dynamic balance ($t=3.21$, $p\leq 0.05$) for the experimental group, whereas the control group showed no meaningful changes. In conclusion, the findings suggest that dynamic stability training effectively improves static and dynamic balance variables among college badminton players and should be considered a valuable component of athletic training programs.

KEYWORDS: Dynamic stability, badminton, static and dynamic balance.

INTRODUCTION

Balance plays a vital role in athletic performance, particularly in sports that demand quick directional changes, coordination, and precision, such as badminton. Athletes need both dynamic and static balance to perform efficiently and avoid injury during play. Static balance refers to the ability to maintain the body's centre of gravity while remaining still, while dynamic balance involves maintaining stability while in motion or transitioning between movements. Enhancing these aspects of balance can lead to better agility, reaction time and overall body control on the court. Badminton players regularly perform actions like lunges, jumps, rapid changes in direction, and overhead shots, all of which require a high degree of balance. When balance is compromised, the risk of injury increases and performance may decline. Therefore, incorporating targeted training methods that improve both types of balance becomes essential. Dynamic stability training focuses on exercises that challenge the body's ability to maintain control during movement, simulating the unpredictable and fast-paced nature of sports situations. By including movements that engage multiple joints and muscle groups simultaneously, dynamic stability training helps improve neuromuscular coordination, core strength and proprioception. These improvements can directly contribute to a player's ability to maintain proper form, react quickly, and recover from destabilizing movements during a match. For college-level badminton players, who are in a critical phase of skill development and physical conditioning, dynamic stability training offers a practical and effective approach to enhancing athletic performance. As balance plays a foundational role in badminton, exploring the effects of such training on balance variables provides valuable insight for coaches, trainers and athletes aiming to optimize performance and reduce injury risk.

METHODS AND MATERIALS

The purpose of this study was to examine influence of dynamic stability training on selected static and dynamic balance among college men badminton players. For this study, thirty men badminton players were selected from Bharathiar University, Departments, Coimbatore district, Tamil Nadu were selected as subjects. Among them 15 subjects were equally divide into two chosen for the experimental group and control group. The subjects were informed about the objectives of the study and the tasks they would be performing. Their badminton coaches were requested to motivate and advise them to fully cooperate during the research

study. The experimental group participated in the training programme, while the remaining 15 subjects were taken as the control group, and they did not underwent any training. The selected variables were tested using static balance was measured by stroke stand balance test and dynamic balance was measured by modified bass test. The training programme for the experimental group lasted for 6 weeks, with 60-minute sessions held on three alternative days each week. Each training session started with 10 minutes of strength exercises, followed by 15 minutes of warm-up, 25-minutes of training workout with rest intervals of 30 seconds between sets and finally, a 10-minute cool-down. The repetitions were gradually increased according to the training schedule.

Statistical Analysis

The collected data before and after the 6-week training period on the aforementioned variables, under the influence of dynamic stability training were statistically analyzed using the dependent 't' test to determine the significant improvements between the pre-test and post-test. The derived results are discussed in the following tables.

Table 1: Analysis of 't' ratio for the pre and post-tests of experimental and control group on static and dynamic balance.

Group	Variables		Mean	SD	MD	SE	t- ratio
Experimental Group	Static Balance	Pre Test	27.93	2.81	2.53	1.17	**2.15***
		Post Test	30.46	2.72			
	Dynamic Balance	Pre Test	42.53	3.96	2.6	0.80	**3.21***
		Post Test	43.46	4.24			
Control Group	Static Balance	Pre Test	27.53	2.79	0.06	0.46	0.14
		Post Test	27.60	1.84			
	Dynamic Balance	Pre Test	42.53	3.96	0.95	01.19	0.78
		Post Test	43.48	4.24			

Significant level at 0.05 (2.14)

Table-1 shows the computation of mean, standard deviation and 't' ratio on the selected variables namely static and dynamic balance for the experimental group. The obtained 't' ratios for static and dynamic balance were 2.15* and 3.21* respectively. The required table value for the degrees of freedom 1 and 19 at the 0.05 level of significance was 2.14. Since the obtained 't' values were greater than the required table value, they were found to be statistically significant for the experimental group. Furthermore, the computation of mean, standard deviation and ’t’ ratio on the selected variables namely static and dynamic balance was conducted for the control group. The obtained 't' ratios were 0.14 and 0.78 respectively.

The required table value for the degrees of freedom 1 and 19 at the 0.05 level of significance was 2.14. Since the obtained 't' values were less than the required table value, they were found to be statistically insignificant for the control group.

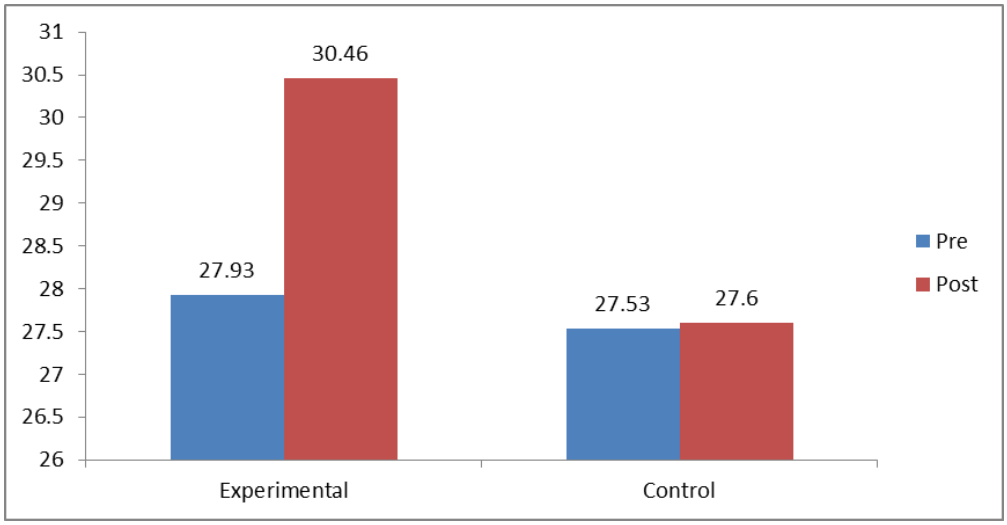

Figure 1: The bar diagram shows the mean pre- and post-test values for static balance variables in the experimental and control groups.

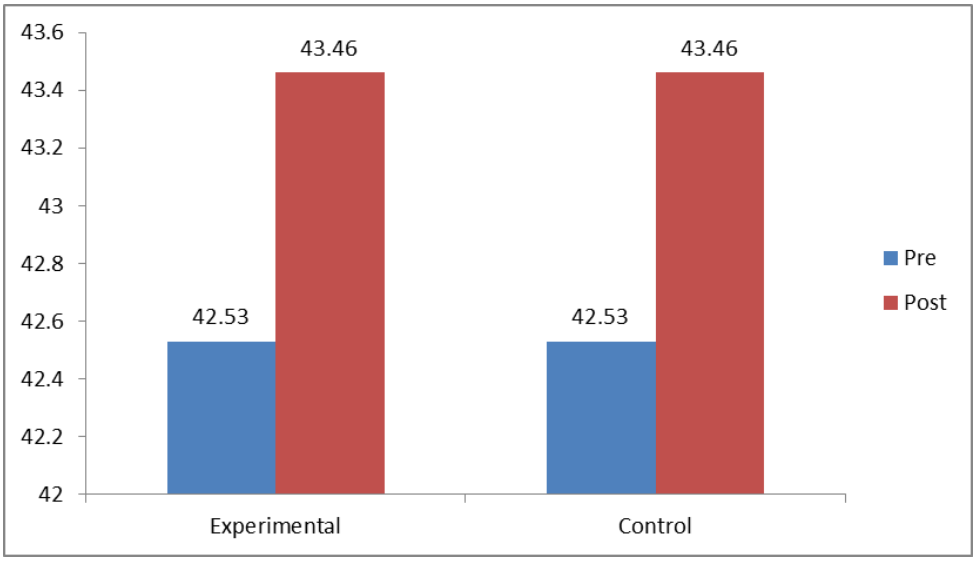

Figure 2: The bar diagram shows the mean pre- and post-test values for dynamic balance variables in the experimental and control groups.

Discussion on Finding

The present study experimented the influence of dynamic stability training significantly improved the selected static and dynamic balance variables among college men badminton players. The results of this study indicated that dynamic stability training is more efficient to bring out desirable changes over the static and dynamic balance variables among college men

badminton players. Dynamic stability training plays a crucial role in enhancing athletic performance, with a particular focus on injury prevention, balance and coordination. The training emphasizes the body's ability to maintain control during rapid movements, unpredictable environments and sudden changes in direction. It involves exercises designed to challenge the neuromuscular system, closely resembling the movement's athletes experience in their sports. By improving the body's ability to respond to unexpected conditions, dynamic stability training helps athletes become more adaptable and resilient. Research indicates that dynamic stability exercises contribute to strengthening the core and lower limbs, which are essential for reducing the likelihood of injuries, such as ankle sprains and knee ligament strains (Hartzell et al., 2020). Additionally, this form of training enhances proprioception, or the body's awareness of its position in space, which aids athletes in maintaining better posture and form, even under pressure (Lee et al., 2018). Over time, the benefits include greater agility, faster reaction times and a better ability to recover from sudden shifts in body position—all vital for optimal athletic performance.

CONCLUSION

Based on the findings of this study, it was concluded that a systematic and scientifically designed six-week dynamic stability training program produced remarkable improvements in the static and dynamic balance among college men badminton players. Additionally, it was determined that dynamic stability training is an appropriate method to develop the static and dynamic balance among college men badminton players.

REFERENCE

1. Behm, D. G., & Colado, J. C. (2012). The effectiveness of resistance training using unstable surfaces and devices for rehabilitation. *International Journal of Sports Physical Therapy*, 7(2), 226–241.
2. Bressel, E., Yonker, J. C., Kras, J., & Heath, E. M. (2007). Comparison of static and dynamic balance in female collegiate soccer, basketball, and gymnastics athletes. *Journal of Athletic Training*, 42(1), 42–46.
3. Croisier, J. L., Ganteaume, S., Binet, J., Genty, M., & Ferret, J. M. (2008). Strength imbalances and prevention of hamstring injury in professional soccer players. *The American Journal of Sports Medicine*, 36(8), 1469–1475.
4. Emery, C. A., Cassidy, J. D., Klassen, T. P., Rosychuk, R. J., & Rowe, B. H. (2005). Effectiveness of a home-based balance-training program in reducing sports-related

injuries among healthy adolescents: a cluster randomized controlled trial. *CMAJ*, 172(6), 749–754.

5. Filipa, A., Byrnes, R., Paterno, M. V., Myer, G. D., & Hewett, T. E. (2010). Neuromuscular training improves performance on the Star Excursion Balance Test in young female athletes. *Journal of Orthopaedic & Sports Physical Therapy*, 40(9), 551–558.
6. Gribble, P. A., Hertel, J., & Plisky, P. (2012). Using the Star Excursion Balance Test to assess dynamic postural-control deficits and outcomes in lower extremity injury: a literature and systematic review. *Journal of Athletic Training*, 47(3), 339–357.
7. Hartzell, D., Smith, D., & Murray, T. (2020). Dynamic stability training: Effects on injury prevention and performance enhancement. *Journal of Sports Medicine*, 25(3), 45–52.
8. Hrysomallis, C. (2011). Balance ability and athletic performance. *Sports Medicine*, 41(3), 221–232.
9. Hübscher, M., Zech, A., Pfeifer, K., Hänsel, F., Vogt, L., & Banzer, W. (2010). Neuromuscular training for sports injury prevention: A systematic review. *Medicine & Science in Sports & Exercise*, 42(3), 413–421.
10. Lee, H., Chang, W., & Lee, S. (2018). The role of proprioception in dynamic stability training for athletes. *Journal of Athletic Training*, 53(1), 10–15.
11. Myer, G. D., Ford, K. R., & Hewett, T. E. (2006). Methodological approaches and rationale for training to prevent anterior cruciate ligament injuries in female athletes. *Scandinavian Journal of Medicine & Science in Sports*, 14(5), 275–285.
12. Paillard, T., Noé, F., Riviere, T., Marion, V., Montoya, R., & Dupui, P. (2006). Postural performance and strategy in the unipedal stance of soccer players at different levels of competition. *Journal of Athletic Training*, 41(2), 172–176.
13. Paterno, M. V., Myer, G. D., Ford, K. R., & Hewett, T. E. (2004). Neuromuscular training improves single-limb stability in young female athletes. *Journal of Orthopaedic & Sports Physical Therapy*, 34(6), 305–316.
14. Sarshin, A., & Minoonejad, H. (2017). The effect of balance training on the postural control and balance of badminton players. *Journal of Sports Science and Medicine*, 16(1), 30–36.
15. Zech, A., Hübscher, M., Vogt, L., Banzer, W., Hänsel, F., & Pfeifer, K. (2010). Balance training for neuromuscular control and performance enhancement: a systematic review. *Journal of Athletic Training*, 45(4), 392–403.