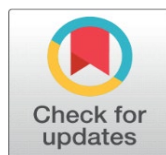
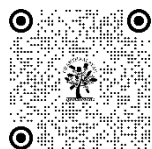


EFFECT OF DYNAMIC EXERCISE AND PNF TRAINING ON THE BALANCE OF LATE ADOLESCENT BOYS

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ABSTRACT

This study examined the effect of a 12-week dynamic exercise program incorporating Proprioceptive Neuromuscular Facilitation (PNF) training on balance among late adolescent boys in Bangalore. A total of 40 participants underwent a pre-and post-test evaluation. The stork stand test is used to measure the balance of the subjects, Descriptive statistics and paired t-tests were used to analyse the data. The findings revealed a significant reduction in balance performance in the post-test results, suggesting that dynamic exercise and PNF training influenced balance outcomes in late adolescence. These results highlight the need for further research to optimize training protocols for improving balance in this age group.

Keywords: Dynamic Exercise, Proprioceptive Neuromuscular Facilitation-PNF, Balance, Late Adolescent

1. INTRODUCTION

Balance is an essential skill in sports that plays a critical role in performance, injury inhibition, and total athletic success. Balance is crucial for almost every physical activity, whether it's recovering from a quick change in direction, retaining control during a quick rotation, or keeping a stable stance during a shot. Physical activity that incorporates movement and works several muscle groups is referred to as dynamic exercise. Strength, flexibility, endurance, and coordination are the goals of these workouts, which are usually done at a moderate to high intensity. Dynamic exercises use continuous motion as opposed to static exercises, which require keeping a posture (such as a plank). Because they test the body's ability to maintain stability during movement. A crucial component of both static and dynamic balance dynamic exercises is a great approach to enhancing balance. The capacity to retain stability and control when moving or changing postures is known as dynamic balance, and dynamic exercises mimic real-life situations where balance is continuously changing.

A specialized stretching method called PNF (Proprioceptive Neuromuscular Facilitation) training is frequently used in sports and fitness to increase motor control, strength, balance, and flexibility. Muscle contraction and stretching are both used to improve the efficiency of muscle training and recovery. PNF is frequently used to improve range of motion and boost athletic performance. PNF training, which emphasizes proprioception, muscle coordination, and

neuromuscular control, is a useful technique for enhancing balance in sports. Athletes can improve their capacity to maintain both static and dynamic balance, which is essential for performance and injury prevention in a wide range of sports, by implementing PNF exercises into their training. For children in their late adolescence (usually between the age of 16 -19 years). Balance is an essential skill, particularly at this time of physical, neurological, and emotional development. During this stage, balance can affect daily activities, injury prevention, general health, and athletic performance. Since boys in this age range frequently go through growth spurts, muscle mass changes, and coordination issues, improving balance is crucial to their physical development.

Hence the present study aims to assess the Effect of Dynamic Exercise & PNF Training on the Balance of Late Adolescent Boys.

1.1. THE OBJECTIVE OF THE STUDY

To examine the effectiveness of dynamic exercise and proprioceptive neuromuscular training on the Balance of late adolescent boys.

1.2. THE HYPOTHESIS OF THE STUDY

It was hypothesized that dynamic exercise & proprioceptive neuromuscular training would significantly increase the balance in late adolescent boys.

2. REVIEW OF LITERATURE

Brett Piper (2009) examined the effect of PNF stretching on the agility of high school players. This study investigated the impact of PNF stretching on the agility test times of high school athletes. The investigator selected 15 physically active teenagers from Burgettstown High School in Pennsylvania for this study. The investigator-assessed each individual over a three-day period, employing no stretching, hold-relax proprioceptive neuromuscular facilitation (PNF), and contract-relax PNF techniques. We elongated the hamstrings and quadriceps. We elongated each muscle group three times, employing a ten-second static stretch followed by a four-second antagonist muscular contraction. Following the stretching session, participants completed an agility T-Test. Repeated measures analysis of variance (ANOVA) with an alpha level below 0.05 was employed to compare the mean timings from the three trials of thirty volunteers. The two PNF stretching methods and control trials exhibited no significant differences ($F(2, 56) = 0.046, p > 0.05$).

ID. G. Fotiadou, et al. (2009) "The effect of Rhythmic Gymnastics on Dynamic Balance Proficiency in Individuals with Intellectual Disabilities." *Strength and Conditioning Research*, Volume 23, Issue 7, Pages 2102-2106, October 2009.

42 Yilmaz and colleagues This study investigated the impact of water activities and swimming on mental impairment in children's fitness. Sixteen male patients at the rehabilitation clinic comprised nine trainable individuals and seven educated individuals. The groups had average ages of 12.22 ± 0.49 and 14.71 ± 0.52 years, respectively. A 10-week training program consisting of two 40-minute sessions each week was implemented. Cardiovascular endurance, muscular endurance, speed, static balance, and agility were assessed using pre-and post-tests. The results indicated significant enhancement in both groups.

3. METHODOLOGY

The researcher adopted an experimental research design to accomplish the goal of the current investigation. The Investigator randomly Selected 40 late adolescent boy students from Bangalore for this study. The group received proprioceptive neuromuscular training and dynamic exercise, For twelve weeks. The researcher used the Stork Stand Test to measure the balance of the subjects. The data was collected by the researcher before and after the 12-week training program.

Statistical Technique: The following statistical procedure was Used to evaluate the effect of dynamic exercise and proprioceptive neuromuscular training on the Balance of Late Adolescent Boys. The researchers have used both descriptive and comparative methods for statistical analysis. We used the mean and standard deviation for descriptive analysis and the T-test for comparative analysis.

3.1. DATA ANALYSIS AND INTERPRETATION

Table 1.1 Descriptive Statistics of Balance

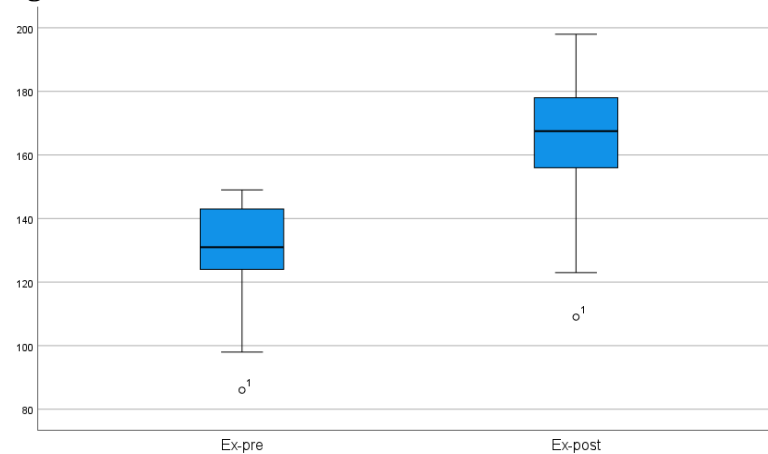
Experiment	N	Minimum	Maximum	Mean	Std. Error	Std. Deviation
Pre	40	86	149	130.48	2.27	14.39
Post	40	109	198	166.05	3.11	19.71

Interpretation: The above table presents the descriptive statistics of the balance scores for the experimental group pre-test and post-test.

Table 1.1 provides the experimental group's pre-test mean score is 130.48, with a standard deviation of 14.39 and a standard error of 2.27, the minimum and maximum scores being 86.00 and 149.00 respectively. The experimental group's post-test results show a mean score of 166.05, with a standard deviation of 19.71 and a standard error of 3.11, the minimum and maximum scores being 109.00 and 198.00 respectively

Figure 1.1 Boxplot of Balance Between Pre and Post-Training

Figure 1



Interpretation: It is evident from the boxplot above that the overall time of balance after training is higher than it was before training.

Table 1.2 Paired Samples T-test

Paired Differences				t - value	df	p-value
	Mean	Std. Error	Std. Deviation			
Pre-Post	-35.575	10.539	1.666	-21.349	39	<0.01

Interpretation: Since the p-value <0.01, at a 1 % level of significance the null hypothesis is rejected and hence concludes that, among the late adolescent boys there exists a significant difference in the duration of balancing between before and after training. Additionally, we can say that the training was successful in improving balance.

3.2. DISCUSSION ON FINDINGS

The pre and post-test results of Balance showed a significant difference in the experimental group after 12 weeks of training in dynamic exercise and PNF training.

The post-test scores of the late adolescence group showed an improvement of 27.26% when compared with the pre-test scores.

This shows that after 12 weeks of dynamic exercise and PNF training, the late adolescent group's balance has been improved. This indicates that the late adolescents are especially receptive to these interventions, probably because of their developing physical and physiological resilience. As a result, targeting this age group could have a significant positive impact on physical fitness outcomes.

This result is also supported by some of the studies-

- **Emilio et al., (2014)** Investigated the effects of proprioceptive training on elderly individuals, along with the correlation between flexibility, balance, and lumbar strength (physical fitness assessments) and balance capability and fall risk (functional balance evaluations).
- **ID. G. Fotiadou, et al. (2009)** Investigated the effects of proprioceptive training on elderly individuals, along with the correlation between flexibility, balance, and lumbar strength (physical fitness assessments) and balance capability and fall risk (functional balance evaluations).

4. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

The 12-week Dynamic Exercise & PNF training program significantly Increased the Balance in students belong to the late adolescence group.

RECOMMENDATIONS

The following recommendations were made based on the conclusions:

- 1) The similar training programs should be added in the curriculum in educational institutions to foster physical and mental well-being among students.
- 2) Future research could explore the effects of training plans on other psychological parameters such as aggression, concentration, pressure, etc.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

- Bettencourt, A. M., & Wadsworth, D. D. (2021). The role of balance training in improving physical fitness in adolescents. *Journal of Strength and Conditioning Research*, 35(4), 1054-1062.
- López, A. A., & García, C. M. (2019). Impact of balance training on physical fitness and motor skills in adolescents: A systematic review. *Journal of Physical Education and Sport*, 19(4), 1487-1495.
- Ramos, S. D., & Silva, G. R. (2020). Balance and physical fitness in adolescents: Exploring the relationship between balance skills and overall fitness performance. *Journal of Adolescent Health*, 67(2), 184-191.
- Santos, R. A., & Costa, M. M. (2018). Effects of balance training on the physical fitness and functional performance of adolescents: A longitudinal study. *Pediatric Exercise Science*, 30(3), 305-315.
- Zhou, Q., & Li, J. (2022). Balance training and its effects on cardiovascular and muscular fitness in adolescents. *Sports Medicine*, 52(1), 47-55.