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Effect of Dynamic Exercises and PNF Training on Agility in Adolescents

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Abstract: This study investigates the effects of a 12-week intervention involving dynamic exercises and Proprioceptive Neuromuscular Facilitation (PNF) training on agility among adolescent boys across three developmental stages: early, middle, and late adolescence. A total of 240 participants were divided into control and experimental groups, each further stratified by age group. Pretest and posttest agility scores were analyzed using descriptive statistics and ANCOVA. Results revealed a significant improvement in agility in the experimental group, particularly among late adolescents, indicating the effectiveness of the intervention program.

1. Introduction: Agility is a critical component of physical fitness in adolescents, contributing to enhanced athletic performance and overall coordination. During adolescence, significant physiological and neurological changes occur, making this a crucial period for physical training. Dynamic exercises and Proprioceptive Neuromuscular Facilitation (PNF) training have shown promise in improving agility and motor skills. This study evaluates the effectiveness of these interventions in improving agility across three age categories of adolescence.

2. Methodology:

2.1 Participants: The study sample included 240 adolescent boys from Bangalore, distributed evenly into three age categories: - Early Adolescence (80 participants) - Middle Adolescence (80 participants) - Late Adolescence (80 participants)

Each age group was further divided equally into control and experimental groups (n=40 each).

2.2 Intervention: The experimental group participated in a 12-week training program that included dynamic exercises and PNF techniques. The control group continued their regular activities without any specific intervention.

2.3 Data Collection: Agility was assessed using standardized agility test – 4 x10 meter Shuttle Run at pretest and posttest stages.

3. Results:

Table 1: Group-wise Descriptive Statistics for Agility

Group	Time	N	Min	Max	Mean	SD Error	SD
Control	**Pre**	120	9.06	13.67	11.24	0.09	1.05
	Post	120	9.00	13.55	11.11	0.09	1.02
Experimental	**Pre**	120	9.12	13.52	11.30	0.08	0.96
	Post	120	8.76	13.21	10.80	0.08	0.97

Table 2: Age Group-wise Descriptive Statistics for Agility

Age Group	Time	N	Min	Max	Mean	SD Error	SD
Early Adolescence	Pre	80	10.56	13.67	12.14	0.08	0.72
	Post	80	10.24	13.55	11.85	0.08	0.72
Middle Adolescence	Pre	80	10.12	12.78	11.41	0.06	0.54
	Post	80	10.00	12.68	11.07	0.05	0.51
Late Adolescence	Pre	80	9.06	12.03	10.26	0.07	0.64
	Post	80	8.76	11.99	9.96	0.07	0.70

Table 3: ANCOVA Results for Agility

Source	Sum of Squares	df	Mean Square	F-ratio	p-value
Agility Pre	89.86	1	89.86	4622.24	<0.05
Group	7.89	1	7.89	406.12	<0.05
Age Group	0.15	2	0.07	3.94	<0.05
Group X Age Group	0.30	2	0.15	7.94	<0.05
Within Group	4.53	233	0.19	--	--

Table 4: Adjusted Posttest Mean Scores by Group

Group	Pre Mean	Post Mean	Adjusted Mean
Control	11.24	11.11	11.14
Experimental	11.30	10.80	10.78

Figure 1: Pre, Post, and Adjusted Posttest Mean Scores by Group

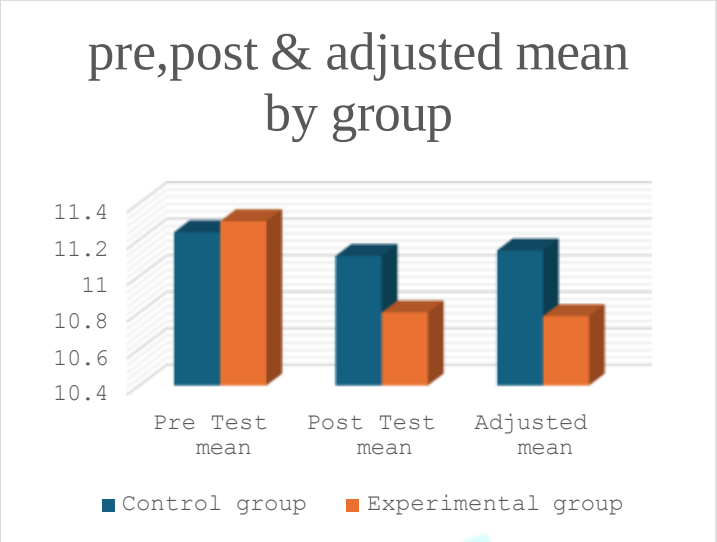
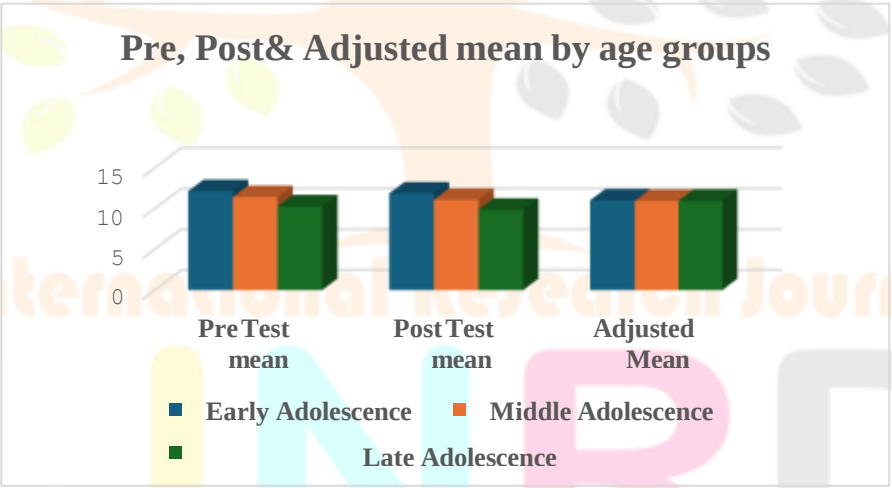


Table 5: Adjusted Posttest Mean Scores by Age Group

Age Group	Pre Mean	Post Mean	Adjusted Mean
Early Adolescence	12.14	11.85	11.00
Middle Adolescence	11.41	11.07	10.93
Late Adolescence	10.26	9.86	10.95

Figure 2: Pre, Post, and Adjusted Posttest Mean Scores by Age Group



4. Discussion: The results indicate a statistically significant improvement in agility scores among the experimental group, especially in late adolescence. The effectiveness of dynamic and PNF exercises in enhancing neuromuscular coordination likely contributed to these outcomes. The interaction effects observed between age group and intervention suggest that training responsiveness varies with developmental stage.

5. Conclusion: The study concludes that a structured 12-week program incorporating dynamic exercises and PNF techniques significantly improves agility among adolescents, with the greatest gains observed in late adolescence. These findings support the integration of age-specific training modules in school physical education curriculum.

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