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Effect of Six Weeks of Motor Skills Training on Selected Psychomotor Variables Among Young Female Basketball Players

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Abstract - The purpose of this article was to investigate the effects of psychomotor training on specific psychomotor variables of young female basketball players. Thirty female basketball players in all were chosen at random for the study and split equally into two groups: the Experimental Group and the Control Group. Over the course of six weeks, the experimental group received psychomotor training three times a week (on Mondays, Wednesdays, and Fridays) for forty to forty-five minutes. No training of any kind was given to the control group. The three dependent variable's rhythmic ability, balance ability, and response ability were evaluated for each person. Descriptive statistics and a paired t-test were used to analyze the data at the significance level of 0.05. The study's findings revealed that while the control group did not experience any improvements, the young basketball players who received motor skill training for six weeks experienced an improvement in their psychomotor development.

Keywords: psychomotor, reaction, balance, rhythmic, basketball

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INTRODUCTION

According to Singer (1975, 1980), psychomotor learning is associated with situational and organismic elements required for the performance and acquisition of behaviours that are typically represented by movement. Actions like touching, moving, or modifying an object as well as controlling the body or certain bodily parts are examples of psychomotor skills.

Psychomotor training fosters holistic child development by enhancing socialization, self-awareness, and communication through interactive play. It enables children to establish boundaries, define roles, and cultivate self-control while promoting empathy and understanding of others (Guralnick, 2010; Oermann, 1990). This approach shifts from fault-based merit systems to strengths-focused experiential learning, encouraging individuality and character development. Non-coercive play stimulates expressiveness, curiosity, and adaptability, meeting children's demand for novelty and acknowledging behavioral diversity (Cioni & Sgandurra, 2013; Crocker & Dickinson, 1984). By emphasizing intrinsic motivations and unstructured exploration, psychomotor training supports personality growth and facilitates a robust foundation for social competence.

A part-task approach that separates the connected cognitive and motor domains for focused instruction is recommended by psychomotor training. Two categories of component skills that comprise psychomotor skills are the development of motor actions and the recognition of environmental factors that trigger actions.

Sychomotor training is defined by researchers as a process that integrates cognitive functions and motor skills to enhance the coordination, efficiency, and precision of physical movements. According to **Oermann (1990)**, it focuses on developing the relationship between mental processes and physical actions, particularly through deliberate practice and repetition. **Guralnick (2010)** highlights its role in early development, emphasizing how it aids in refining motor skills alongside improving social and cognitive capabilities. Similarly, **Cioni and Sgandurra (2013)** describe it as a therapeutic intervention aimed at promoting motor and behavioral adaptation, especially in developmental contexts.

In sports, **Bertollo et al. (2016)** and **Toolis et al. (2023)** link psychomotor training to enhanced performance by refining attention, reaction time, and

motor control through neurofeedback protocols targeting brain activity related to motor execution and focus. These definitions collectively underscore its application across developmental, therapeutic, and performance-enhancement domains.

Psychomotor training enhances athletic performance by improving coordination, reaction times, focus, and decision-making. This training focuses on the interaction between cognitive processes and motor functions, benefiting athletes in high-demand sports. Psychomotor training supports athletes by fostering a neural environment conducive to peak performance. Combining this with traditional physical training provides a holistic approach to sports preparation, ensuring improved outcomes in precision, focus, and adaptability.

Although quite enough work has been done in the field of psychomotor training and its effects on various aspects of psychomotor development, there is scarcity of studies as well as literature on female population. Therefore, the present study was undertaken to investigate the effect of psychomotor training on selected psychomotor variables among young girl basketball players.

METHODOLOGY

Subjects

Thirty female basketball players in total were chosen randomly and subjects were divided in to two groups: the Experimental Group and the Control Group. For six weeks, the experimental group received psychomotor training three times a week (on Mondays, Wednesdays, and Fridays) for forty to forty-five minutes each time. No training of any kind was provided to the control group.

Data Collection

The data was collected before and after the completion of training on the selected dependent variables. Three dependent variables—balance ability, response ability, and rhythmic ability—were examined for each subject. Before the training began and after the training session ended, the data for these variables was gathered.

The Modified BASS Test was used to assess balance abilities. The students' ability to sprint at a specific rhythm was used to assess their rhythmic skills. The ruler drop test was used to gauge the subject's reaction time.

Statistical Analysis

Descriptive statistics and the paired t-test were used for the data analysis at the 0.05 level of significance. Descriptive statistics were represented to understand the nature of data. After satisfying the assumptions of normality of parametric data, paired t-test was used to compare the pre-test and posttest scores of each variable for different groups.

RESULTS

Table 1. Descriptive Statistics for Experimental Group

Variable	Mean	N	Std. Deviation
Balance_pre	4.875	15	1.668
Balance_post	6.75	15	1.238
Reaction_pre	19.25	15	3.855
Reaction_post	17.37	15	3.344
Rhythmic_pre	3.13	15	0.748
Rhythmic_post	2.864	15	0.668

Table 2. Paired t-test analysis for Experimental Group

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Balance_pre - Balance_post	-1.875	1.087	0.271	-2.454	-1.295	-6.895	15	.000
Pair 2	Reaction_pre - Reaction_post	1.875	1.586	0.396	1.029	2.720	4.728	15	.000
Pair 3	Rhythmic_pre - Rhythmic_post	0.271	0.132	0.033	0.200	0.341	8.191	15	.000

Table:2 Provides a detailed comparison of pre-test and post-test results across the three dependent variables: balance, reaction, and rhythmic ability. The statistical analysis reveals a significant improvement in all three variables, with p-values less than 0.05, indicating that the observed changes are statistically significant. This suggests that the intervention had a positive effect on enhancing these psychomotor skills.

Table 3. Descriptive Statistics of Control Group

Variable	Mean	N	Std Deviation
Balance_pre	5.875	15	1.746
Balance_post	5.250	15	1.390
Reaction_pre	21.00	15	4.033
Reaction_post	21.125	15	3.403
Rhythmic_pre	2.995	15	0.475
Rhythmic_post	2.936	15	0.476

Table 4. Paired t-test analysis of Control Group

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Balance_pre - Balance_post	0.625	1.024	0.256	0.078	1.141	2.440	15	.058
Pair 2	Reaction_pre - Reaction_post	-0.125	1.543	0.385	-0.947	0.697	-0.324	15	.751
Pair 3	Rhythmic_pre - Rhythmic_post	0.058	0.252	0.063	-0.075	0.193	0.931	15	.367

Table 4 presents the comparison of pre-test and post-test results for the three dependent variables (balance, reaction, and rhythmic ability) within the control group. The statistical analysis indicates no

significant improvement in these variables, as the p-values are not less than 0.05. This suggests that the control group did not experience meaningful changes in balance, reaction, and rhythmic ability over the course of the study.

DISCUSSION

The study's findings demonstrated that while the control group did not experience any changes, the psychomotor development of young girl basketball players who received psychomotor training for six weeks improved. After six weeks, the experimental group's dependent variables—reaction, rhythmic, and balancing abilities—improved, indicating a significant impact of psychomotor training on the chosen dependent variables.

Recent studies highlight the diverse benefits of psychomotor training across various fields. In child development, Guralnick (2010) and Cioni & Sgandurra (2013) emphasize its role in improving fine and gross motor skills and reducing developmental delays, especially for children with neurological impairments. Similarly, Oermann (1990) identifies the integration of cognitive and motor functions in training as essential for better self-regulation and enhanced social interactions. In sports, Toolis et al. (2023) and Chen et al. (2022) demonstrate that neurofeedback-based psychomotor training refines focus and precision, as evidenced in biathletes and golfers, through brainwave modulation techniques like FM theta and SMR adjustments

In addition to motor improvements, psychomotor training supports stress management and cognitive performance, particularly under competitive conditions. Parr et al. (2021) found that incorporating biofeedback techniques helps athletes maintain composure and cognitive sharpness. Furthermore, studies by Bertollo et al. (2016) highlight the role of psychomotor training in rehabilitation, showing its effectiveness in post-stroke motor re-learning and adaptability. Together, these findings illustrate the adaptability of psychomotor training in enhancing performance, fostering developmental progress, and aiding recovery.

Recent studies highlight the expanding role of psychomotor training in sports, emphasizing neurofeedback (NFT) and biofeedback techniques for improving athletic performance. Research has shown that NFT can enhance athletes' psychomotor efficiency by training brain wave activities, such as sensorimotor rhythm (SMR), FM theta, and T3 alpha waves. These protocols have been applied in tasks like golf putting and rifle shooting to improve focus, reaction time, and accuracy.

Consequently, the investigator can draw the conclusion that psychomotor training benefits young girl players' psychomotor development. As a result, the training programme should incorporate psychomotor training at various levels.

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