



IMPACT OF PSYCHO-PHYSICAL TRAINING ON SELECTED PSYCHOMOTOR ABILITIES OF MALE HANDBALL PLAYERS

Manivannan. T.A¹, Dr. S.T.N. Rajeswaran²

¹Ph.D., Research Scholar, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu.

²Professor, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu.

ABSTRACT

The present study aimed to determine the impact of psycho-physical training on selected psychomotor abilities, specifically depth perception and eye-hand coordination, among male handball players. For this purpose, a sample of 96 students participating in inter-school competitions, aged between 13 and 17, was selected. The experimental design employed a pre-post random group design. Initially, 74 samples were assessed for their overall playing abilities, and those scoring between 4 and 5 were further screened, resulting in a total of 42 samples. From these, 30 samples were randomly selected and divided equally into two groups, each consisting of 15 subjects. Group 1 underwent psycho-physical training (PPT), while Group 2 served as the control group (CG), maintaining their regular training routines without specific psycho-physical interventions. The psycho-physical training regimen for Group 1 spanned approximately twelve weeks, with sessions conducted five days a week. Collected data from pre-tests and post-tests were analyzed using paired t-tests, analysis of variance, and adjusted post-test means to assess the individualized and comparative impact of psycho-physical training compared to traditional training alone on selected psychomotor abilities. A significance level of 0.05 was chosen to test the significance of the results derived. The study results confirmed the positive impact of psycho-physical training on selected psychomotor abilities, including depth perception and eye-hand coordination.

INTRODUCTION

Handball, a dynamic Olympic team sport, relies heavily on fundamental abilities such as strength, power, speed, and endurance for successful performance (Sporis et al., 2010). The sport's demanding nature, combining creativity with speed, strength, and coordination, presents both challenges and allure (Sporis et al., 2010). Psycho-physical training has emerged as a significant influence in handball, blending mental and physical techniques to optimize player performance (Granero-Gallegos et al., 2020). This holistic approach integrates cognitive strategies with physical conditioning, enhancing players' decision-making and reaction times on the court (Granero-Gallegos et al., 2020). Visualization exercises, for instance, refine decision-making processes, enabling athletes to respond swiftly during gameplay (Olmedilla et al., 2020). Sensory drills improve proprioception and spatial awareness, thereby enhancing coordination and agility (Hartmann et al., 2010). Moreover, incorporating breathing techniques into training fosters composure under pressure (Schunemann et al., 2016), while heightened focus sharpens anticipation, elevating precision and reaction times (Zhang et al., 2019). Ultimately, psycho-physical training equips handball players with a well-rounded skill set, enhancing both individual performance and teamwork (Beckmann & Elbe, 2015). Recognizing the significance of psychomotor abilities and incorporating them into training enhances concentration and minimizes distractions (Rani, 2015). Despite advancements, there remains considerable room for improvement in the realm of psychomotor skills. These skills, defined as the intricate interplay

between mental processes and physical movements, are crucial for skill execution and development (Rani, 2015). While current training methods prioritize physical conditioning, there's a notable gap in addressing psychomotor training, highlighting the need to bridge this divide to achieve optimal performance in handball.

METHODOLOGY

To achieve the objectives outlined in the present study, the researcher employed specific means and methods. The study aimed to investigate the impact of psycho-physical training compared to a control group on selected psychomotor abilities, namely depth perception and eye-hand coordination of male handball players. A pre-post random group experimental research design was utilized for this purpose. Convenience sampling was employed to select participants, with 74 students involved in inter-school competitions randomly chosen. Participants' ages ranged from 13 to 17 years old. To ensure homogeneity among the experimental groups, initial assessments of overall playing ability were conducted using the expert rating method. From the initial pool of 74 participants, 42 were identified based on moderately high overall playing abilities. Among these, 30 were randomly divided into two equal groups, each comprising 15 subjects. Group 1 was designated as the Psycho-Physical Training (PPT) group, while Group 2 served as the Control Group (CG). The selected variables for assessment were participants' performance in depth perception and eye-hand coordination, which were measured using standardized tests administered by



research scholars in physical education. Depth perception was measured using a depth perception apparatus in centimeters, while eye-hand coordination was assessed using the mirror tracing test in counts. These measurements constituted the pre-test scores.

Following the initial assessment, Group 1 received psycho-physical training while Group 2 underwent traditional training exclusively. Participants in the control group continued with their regular training routines without any specific psycho-physical training interventions. The psycho-physical training regimen for Group 1 spanned approximately twelve weeks, with sessions

conducted five days a week. These sessions comprised drills targeting coordinative abilities, fundamental skills, and psychological exercises, each lasting between 60 to 70 minutes. Upon completion of the treatment period, both groups were retested on the variables of depth perception and eye-hand coordination, serving as post-test scores. The collected data underwent statistical analysis using paired t-tests, analysis of variance, and analysis of covariance to assess the individual and comparative effects of psycho-physical training and traditional training alone on the targeted psychomotor abilities. A significance level of 0.05 was applied to evaluate the significance of the results. The study's findings are presented below.

RESULTS

Table 1: Significance of mean gains & losses between pre and post-test scores of psycho-physical training group on selected psychomotor abilities of depth perception and hand-eye coordination of male handball players

Variables	Pre-test (Mean)	Post-test (Mean)	MD	SEM	't'-ratio	sig
Depth Perception	4.56	3.47	1.08	0.23	4.69*	0.00
Eye-Hand Coordination	44.27	38.87	5.40	1.79	3.01*	0.01

* Significant at 0.05 level

Table - 1 explains the results of psycho-physical training, with t-values of 4.69 (depth perception) and 3.01 (eye-hand coordination). When the "t" values for chosen, psycho-physical training were compared to the crucial value of 2.14 for degrees of freedom 1, and 14. The observed 't' values were found to be

statistically significant at 0.05 levels. From the results, it was inferred that 12 weeks of psycho-physical training has a significant impact on male handball players' abilities of depth perception and eye-hand coordination.

Table 2: Significance of mean gains & losses between pre and post-test scores of the control group on selected psychomotor abilities of depth perception and hand-eye coordination of male handball players

Variables	Pre-test (Mean)	Post-test (Mean)	MD	SEM	't'-ratio	sig
Depth Perception	4.61	4.93	0.32	0.16	1.97	0.06
Eye-Hand Coordination	42.67	44.40	1.73	2.71	0.64	0.53

* Significant at 0.05 level

Table - 2 explains the results of psycho-physical training, with t-values of 1.97 (depth perception) and 0.64 (eye-hand coordination). When the "t" values for chosen, control group were compared to the crucial value of 2.14 for degrees of freedom 1, and 14. The observed 't' values were found to be not statistically

significant at 0.05 levels. From the results, it was inferred that traditional training has a not significant impact on the changes in the abilities of depth perception and eye-hand coordination of male handball players.

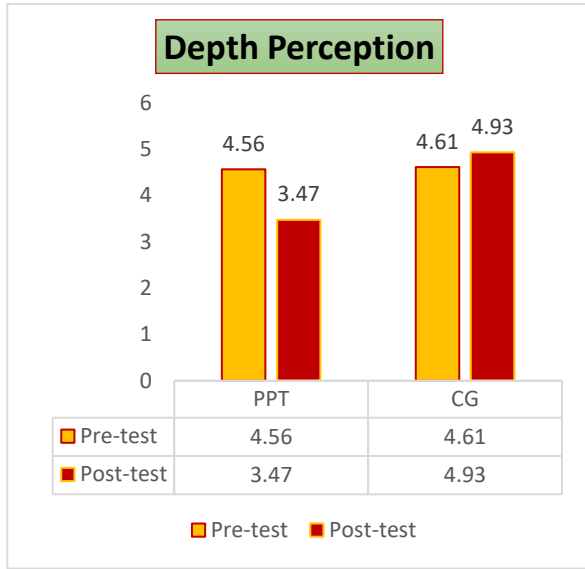


Fig-1

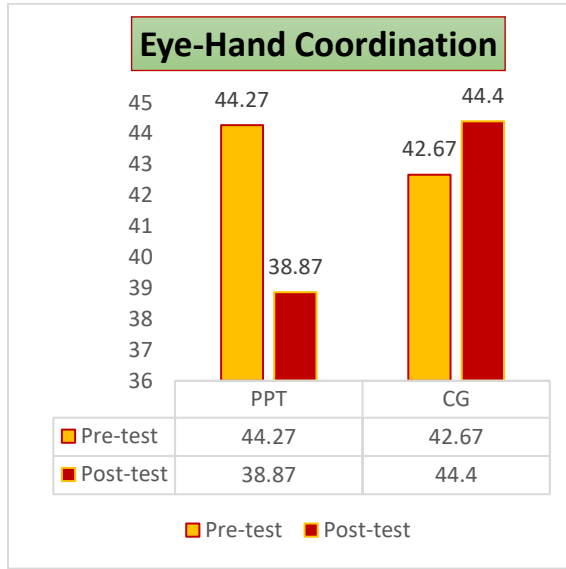


Fig-2

Table 3: Analysis of variance on initial and final means of psycho-physical training of male handball players

Variables		Sources	SS	DF	MS	F - ratio
Depth Perception	Pre-test	Between Sets	0.24	1	0.24	0.06
		Within Sets	116.92	28	4.17	
	Post-test	Between Sets	15.99	1	15.99	4.19*
		Within Sets	106.62	28	3.81	
Eye-Hand Coordination	Pre-test	Between Sets	19.20	1	19.20	0.13
		Within Sets	4126.27	28	147.37	
	Post-test	Between Sets	229.63	1	229.63	4.02*
		Within Sets	1599.33	28	57.12	

* Significant at 0.05 level

Table- 3 explains that the observed F-values are: 0.06 (depth perception) and 0.13 (eye-hand coordination) for the pre-test. In testing the significance of the mean difference between the psycho-physical training (PPT) and control group (CG) was found to be statistically not significant, it failed to reach the required value of (3.74) for df is 1, 28. The observed F-value for the post-test means on selected psychomotor abilities is 4.19 (depth perception) and 4.02 (eye-hand coordination). Since the observed F-value on these variables is greater than the critical

value of (3.74) for df is 1, 28, It is concluded that the observed final mean differences between the psycho-physical training group (PPT) and the control group (CG) group on the variables used in this study after 12 weeks of training treatment were statistically significant. Thus, the results obtained confirm that psycho-physical training (PPT) has more impact on the development of depth perception and eye-hand coordination when compared to the control group (CG).

Table 4: Analysis of covariance on adjusted post-test means on psycho-physical training of handball players

Variables	Sources	SS	DF	MS	F- ratio
Depth Perception	Between Sets	14.90	1	14.90	26.56*
	Within Sets	15.15	27	0.56	
Eye-Hand Coordination	Between Sets	288.23	1	288.23	9.12*
	Within Sets	853.27	27	31.60	

* Significant at 0.05 level



Table 4 reveals that the obtained “F” value was 26.56 (depth perception) and 9.12 (eye-hand coordination). Since the observed F-values on these variables were higher than the required critical value (3.74) at the 0.05 level of significance for df is 1, 27, it was found that the adjusted post-test means differences among the two

groups on selected psychomotor abilities of (depth perception and eye-hand coordination) were found to be statistically significant. It was concluded that psycho-physical training (PPT) has more impact on the development of depth perception and eye-hand coordination when compared to the control group (CG).

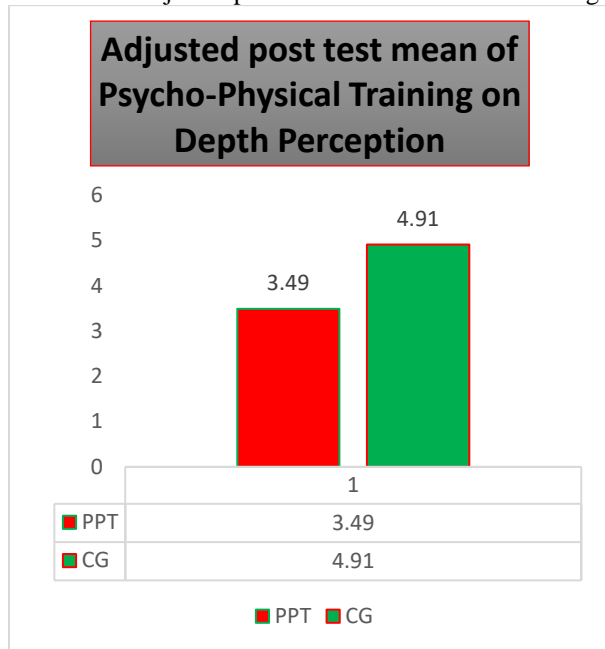


Fig-3

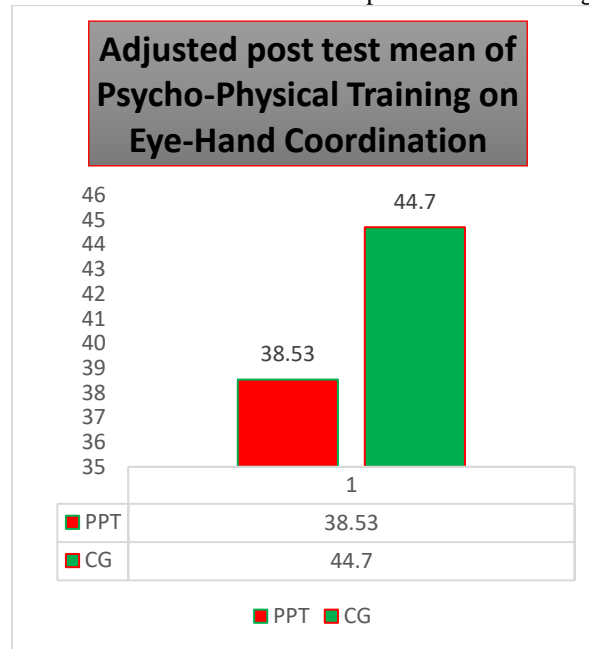


Fig-4

DISCUSSION ON FINDINGS

Based on the results, the following conclusion has been made. In testing the individualized effect of psycho-physical training on selected psychomotor abilities (depth perception and eye-hand coordination), the observed result confirms the positive changes made from pre-treatment and post-treatment. For the control group (CG), the obtained results explained that the no significant changes were observed the depth perception and eye-hand coordination from their pre- to post-treatment. Based on the results of the individualized effect of psycho-physical training (PPT) and control group (CG), it was concluded that the need for psycho-physical training (PPT) may be a viable source for the players.

The current investigation examined the effects of a twelve-week psycho-physical training regimen on both depth perception and eye-hand coordination of male handball players. This study aimed to enhance the players' perception and coordination ability to improve the performance of individuals and ultimately contribute to their success in competitive situations. The findings of the study revealed that psycho-physical training was notably effective in eliciting favorable improvements across various parameters of male handball players.

In the present study, Psychomotor abilities and their need in the game of handball, eye-hand coordination is needed for dribbling, passing, shooting, receiving the ball to the opponent, dropping the

ball from height, and throwing the ball to the place where they want to send it. Skills in handball allow players to make pinpoint passes, shoot with precision, fake out the defense, and dribble the ball. These players have to excel in coordinative abilities between eye-hand coordination. Eye-hand coordination also allows a player to receive a ball with his hand and make adjustments to intercept the ball (S.T.N.Rajeswaran, 2013). The psychomotor training would help the player to perform better in coordinative abilities of eye-hand coordination and depth perception. (Rameshpandian *et al.*, 2021). The study found that psychomotor skills highly improved in-depth perception and eye-hand coordination, skill performance of the psychomotor drills (Wilkins and Gray, 2015).

The findings of this study are highly promising, showcasing the advantages of psycho-physical training. Furthermore, the results indicate that enhancements in mobility can be achieved after just 12 weeks of such training.

CONCLUSION

Upon analyzing the study's findings and acknowledging its inherent limitations, it becomes clear that integrating psycho-physical training has a distinct positive effect on enhancing the selected psychomotor variables (depth perception and eye-hand coordination) of male handball players. Substantial improvements were noted in the selected variables among participants who underwent psycho-physical training over the



twelve weeks. This suggests that the tailored psycho-physical training regimen effectively enhances both depth perception and eye-hand coordination.

It can be inferred that the personalized application of psycho-physical training yielded statistically significant and positive effects throughout the intervention period, contributing to the enhancement of selected psychomotor variables among of male handball players.

In contrast, the control group's individualized interventions did not yield significant improvements in selected psychomotor abilities (depth perception and eye-hand coordination), within the same timeframe. When comparing the outcomes between the psycho-physical training group and the control group, it is evident that the former exhibited substantially greater advancements in psychomotor abilities. This discrepancy highlights the superior impact of psycho-physical training on enhancing depth perception and eye-hand coordination of male handball players.

REFERENCE

1. Beckmann, J., & Elbe, A. M. (2015). *Sport psychology: A comprehensive introduction*. Routledge
2. Granero-Gallegos, A., Baena-Extremera, A., Pérez-Quero, F. J., & Ortiz-Camacho, M. M. (2020). *Psycho-physical training in sports: A systematic review*. *International Journal of Environmental Research and Public Health*, 17(15), 5382.
3. Rameshpandian, B., & Rajeswaran, S. T. N. (2021). *Effect of visual skills with imagery training and visual skills training on select coordinative abilities among the badminton players at school level*. *International Journal of Physiology, Nutrition and Physical Education* 2021; 6(1): 107-111.
4. Olmedilla, A., García-Mas, A., Ortega, E., & Ortín, F. J. (2020). *Effects of mental training with augmented feedback on decision-making and technical-tactical performance in handball players*. *Journal of Human Kinetics*, 72(1), 269-281.
5. Hartmann, M., Hall, S., & Schlesinger, T. (2010). *Sensory training methods in sports: A review*. *Sports Medicine*, 40(12), 997-1017.
6. Schünemann, H., Brożek, J., Guyatt, G., & Oxman, A. (2016). *GRADE handbook for grading the quality of evidence and strength of recommendations*.
7. Kaliraj, D. Suresh, and Mohan Kumar., (2021). "Impact of psychomotor skill training on selected psychomotor abilities of male handball players." *International Journal of Physical Education, Sports and Health* 2021; 8(6): 212-215.
8. Zhang, H., Paul, G., & Qu, X. (2019). *The effects of focus of attention training on motor performance in basketball free throw*. *International Journal of Sports Science & Coaching*, 14(1), 66-73.
9. Rani, K. (2015). *Nishpanda Bhava: A New Concept*. *International Journal of Yoga, Philosophy, Psychology, and Parapsychology*, 3(1), 17-21.
10. Sporiš, G.; Vuleta, D.; Vuleta, D., Jr.; Milanović, D. *Fitness profiling in handball: Physical and physiological characteristics of elite players*. *Coll. Antropol.* 2010, 34, 1009–1014.
11. Przednowek, K., Śliz, M., Lenik, J., Dziadek, B., Cieszkowski, S., Lenik, P., ... & Przednowek, K. H. (2019). *Psychomotor abilities of professional handball players*. *International journal of environmental research and public health*, 16(11), 1909.
12. Pichurin, V., Umerenko, V., & Bretze, L. (2014). *Fundamentals of psycho-physical training of students in physical education*. *Scientific Collection*, 31 (147), 589-594.
13. Rajeswaran, S.T.N., (2013). *Analysis on psychomotor abilities and skill performance variables of football players among varied positions*. *International Journal of Physical Education, Sports and Yogic Sciences*, Vol. 2 No. 2, 25-27.
14. Wilkins L, Gray R. *Effects of Stroboscopic Visual Training on Visual Attention, Motion Perception, and Catching Performance*. *Percept Mot Skills*. 2015; 121(1):57-79.