

## EFFECT OF SPECIFIC TRAINING ON SELECTED BIOMOTOR VARIABLES OF DEXTEROUS

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### Abstract

Dexterous refers to the skill and grace in physical movement, especially in the use of the hands, an individual who is more dexterous with the right hand is called right-handed (dextralists), and one who is more skilled with the left is said to be left-handed (sinistralists). The purpose of the study was to find out the effect of specific training on selected biomotor variables such as strength and coordination of dexterous. To achieve the purpose 40 right hand dominance college men students from Annantnag district, Jammu & Kashmir, India were selected as subjects at random and their age ranged between 18-21 years, the selected subjects were divided in to two groups namely physical training (n=20) and control (n=20). The physical training group underwent training for 60 min/4 days/15 weeks. The maximum strength (handgrip dynamometer) and hand screwing coordination (Bennit hand tool dexterity test), were selected as dependent variables and tested before and after the experimental period for both the groups. The collected data were analyzed by using ANCOVA. Further, independent 't' was calculated to find out the difference between left and right hand and the magnitude of Improvement was also calculated to find out the level of improvement on dexterous. Level of confidence was fixed at 0.05. The result of the study shows that the physical training improved the maximum strength and coordination compared to control group. The difference between right and left hand on maximum strength and coordination is insignificant. Hence, it was concluded that physical training may be given to improve the dexterous (use of hands) level and quality.

**Key Words: Physical Training, Strength, Coordination, Dexterous**

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### INTRODUCTION

Dexterous refers to the skill and grace in physical movement, especially in the use of the hands; adroitness

In other words, ability to manipulate fine objects with the hands. Handedness is the preferred use of the right hand, the left hand, or one or the other depending on the task. Handedness is the natural or biological preference for using one hand more than the other in performing special tasks depending on which hemisphere is dominant for the task (**Rice, 1998**).

The adaptive response by the physiological system of the body to physical training, including the neuromuscular system is directly related to the training stimulus. The physical training involves prolonged muscular work increases physical capacity such as strength, endurance, flexibility, co-ordination and so on. The abilities that involve the use of [hands](#), develop over time, starting with primitive gestures such as grabbing at objects to more precise activities that involve precise hand coordination. Fine motor skills, are skills that involve a refined use of the small muscles controlling the hand, fingers, and thumb. Being right or left-handed that matters, but the strength of preference for one hand over the other. The controversial idea, people are not either left-handed or right-handed but “strong-handed” or “mixed-handed” (**Guiard, Y. 1987**).

Strength refers especially to physical, mental, or moral robustness or vigor, enough work to do, and strength enough to do the work. Power is the ability to do something and especially to produce an effect (**Brookfield, 1994**). Strength is essential for physical activity. The value obtained for the strength of a muscle or muscles depends on the type of action, the velocity of the action, and the length of the muscle or muscles. Although early gains in absolute strength are influenced by neural factors, long-term gains depend mainly on increases in muscle size.

Fine motor skills include the ability to manipulate small objects, transfer objects from hand to hand, and various eye–hand coordination tasks. The training is an effective means of training people to develop the ability to control the movements of their eyes. The exercise helps in the development of hand-eye coordination. The physical training on hand can help improve the fine motor skills of the hands' grasping power and finger flexibility. Physical training using varying softness and hardness being on a continuous basis can build the hand grip. It also makes the hands and fingers stronger (**Kabbash, P, 1994**). These physical training methods to develop fine motor skills and improve hand-eye coordination. It also improves visual skills by showing how to distinguish and associate between dexterous and motor co-ordination.

To achieve the purpose of Right Hand Dominance, the researcher has selected 40 students from GDCA. college men students 40 from Annantnag district, Jammu & Kashmir, India were selected as subjects at random and their age ranged between 18-21 years, the selected subjects were divided in to two groups namely physical training (n=20) and control (n=20). The physical training group underwent training on Bouncing the basketball (right and Left hand alternatively), Wall Catching the ball (right and Left hand alternatively), Ball juggling (right to left hand), Ball juggling (left to right hand), Pec dec (right and Left hand simultaneously) and Arm pullover (right and Left hand alternatively) as physical training, for fifteen weeks, four days per week and sixty minutes per day including warming up and cooling down exercises. The maximum strength (hand grip dynamometer) and hand screwing coordination (Bennit hand tool dexterity test) were selected as dependent variables and tested and after the experimental period for both the groups. The collected data were analyzed by using ANCOVA. Further, independent 't' was calculated to find out the difference between left and right hand and the magnitude of Improvement was also calculated to find out the level of improvement on dexterous. Level of confidence was fixed at 0.05.

**RESULTS:**

**TABLE – I**  
**ANCOVA FOR STRENGTH AND COORDINATION**

VARIABLES	DEXTEROUS	Adjusted Post Test Mean		sov	Sum of Squares	df	Mean Squares	'F' Ratio
		Physical Training Group	Control Group					
HAND SCREWING COORDINATION	Right hand	1.26	1.35	B	0.072	1	0.072	55.10*
				W	0.048	37	0.001	
	Left hand	1.38	1.46	B	0.056	1	0.056	38.61*
				W	0.054	37	0.001	
MAXIMUM STRENGTH	Right hand	55.28	50.75	B	185.58	1	185.58	97.50*
				W	70.42	37	1.90	
	Left hand	37.86	26.91	B	1165.76	1	1165.76	169.07*
				W	255.12	37	6.90	

SOV – Source of Variance, B –Between, W – With-in, df – Degree of Freedom)

\* Significant at .05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 1 and 37 is 4.11).

The table I shows that there was significant difference between the adjusted post-test means of physical training and control group on right and left hand strength and coordination. To find out the improvement on dexterous level, independent 't' ratio was calculated with the magnitude of Improvement (%).

**TABLE – II**  
**DEXTEROUS ‘t’ VALUE AND MAGNITUDE OF DISTANCE**

VARIABLES	DEXTEROUS	Mean	SD	‘t’ Value	Magnitude of Improvement In %
HAND SCREWING COORDINATION	Right Hand	0.12	0.08	0.11	4.95%
	Left Hand	0.11	0.15		2.22%
MAXIMUM STRENGTH	Right Hand	0.94	0.78	1.54	12.38%
	Left Hand	0.65	0.33		11.50%

\* Significant at .05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 38 are 2.03 respectively).

The result of the ‘t’ shows, insignificant difference between right hand and left hand maximum strength (handgrip strength) and screwing coordination (eye hand coordination). The magnitude of Improvement was higher for right hand when compared to left hand on hand grip strength and eye hand coordination. Hence, it was concluded that the selected physical training improves the dexterous level.

**DISCUSSION:** The findings confirm that physical training has a significant impact on strength and coordination. The findings of **Ruth Humphry et al (1995)**, was that, right and left hand rivet removal have more score than arranging the rivets in holes with left and right hand. This might be because of the time taken for manipulation while picking up rivets from container, when other conditions are constant like position of test platform & the subject, the distance that the arm movement is covering. The finger dexterity test is used to assess a subject’s fine motor skills. It is performed by one hand and the time score is inversely related to the performance. This test revealed that there was no statistically significant difference between the performance scores of the left and right hands in any of the groups, **Nalcacy E, Cicek M, Genç Y, (2001)**. There is no difference handedness between the dominant and non-dominant hands in performance of tasks requiring eye-hand and arm-hand coordination, **Benton AL, Meyers R, Polder GJ, (1992)**. The present result are also shows the same.

**Lucy Hodges, Jo Adams (2007)**, investigated the differences in grip strength and dexterity of the dominant and non-dominant hands. Between-group comparisons found that left-handed individuals were significantly more dexterous with their non-dominant hand compared with the right-handed group, **Incel et al (2002)**, documented significantly more grip strength in dominant hands than in non-dominant hands for right-handed people. Similarly, the results of right-handed subjects indicated significantly greater grip strength in the dominant hand in both flexed and extended elbow positions. The resent study shows the dominant hand shows better improvement when compare with nondominant hand. Hence, the physical training has improves the nondominant hand performance from his base level.

The left-handed subjects exhibited no such difference in either elbow position, (Crosby, C. A., & Wehbe, M. A 1994). Speed-strength as the “ability to quickly execute an unloaded movement or a movement against a relatively small external resistance. Speed-strength is assessed by the speed of movement, (Verkhoshansky, Y 1986). , The ability to produce maximal force and the ability to achieve great velocity in the same motion are different motor abilities. The rate of force development is much more important, if the time available for force development is short, rate of force development is more important than maximal strength (Zatsiorsky, V.M, 1995).

**CONCLUSION:** It was concluded that the physical training improves strength (maximum strength) and coordination (hand screwing coordination) of dexterous (Hands). Hence, the dominant hand shows better improvement on maximum strength and hand screwing coordination whereas, non-dominant hand has improves strength and coordination when compared to base level.

**IMPLICATION:** If an individual having better dexterity, they can able to do any sort of work with both hands simultaneously without having any tired. The findings of the study were helpful to the coaches and physical educationist to enhance the strength and coordination of dexterous to the players who involved in the various sports activities. The physical training on dexterity was helpful to the players to use there both dominant and non-dominant hands effectively. Being ambidextrous (using both hands) in sports activity is especially helpful during high-level competition. Further the rocket and bat game players will be given such type of specific physical training to improve their dexterity, and to reduce higher use syndrome of land.



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