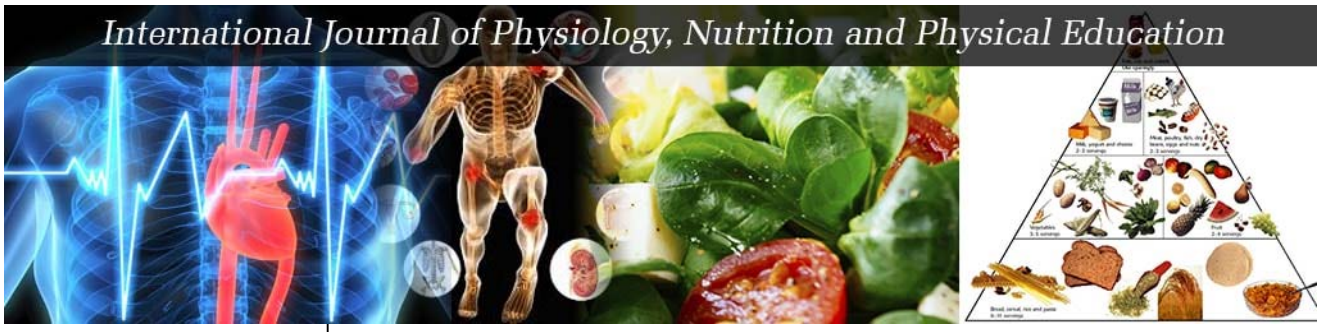

ISSN: 2456-0057
IJPNPE 2018; 3(2): 2241-2243

www.journalofsports.com
Received: 12-05-2018
Accepted: 17-06-2018

K Kathiravan
Ph.D. Research Scholar, Department of Physical Education Annamalai University, Annamalai Nagar, Tamil Nadu, India

Dr. S Vijay
Assistant Professor/Director of Physical Education Department of Physical Education, Annamalai University, On. Deput. Govt. Polytechnic College, Tiruvannamalai, Tamil Nadu, India

Corresponding Author:
K Kathiravan
Ph.D. Research Scholar, Department of Physical Education Annamalai University, Annamalai Nagar, Tamil Nadu, India

Effect of isolated and combined dextrality and sinistrality physical training on muscular strength among school handball players

K Kathiravan and Dr. S Vijay

Abstract
Handedness is an attribute of humans defined by their unequal distribution of fine motor skill between the left and right hands. An individual who is more dexterous with the right hand is called right-handed (sinistralists), and one who is more skilled with the left is said to be left-handed (dextralists). The purpose of the study was to find out the effect of isolated and combined physical training on muscular strength among school handball players. For the propose 30 right hand dominance boy students from Nagapattinam district, Tamilnadu, India were selected as subjects at random and their age range between 12-14 years, the selected subjects were divided in to three equal groups of ten subjects each namely dextrality physical training group (n=10), sinistrality physical training group (n=10), and combined dextrality and sinistrality physical training group (n=10). The physical training group underwent training for fifteen weeks, four days per week and sixty minutes per day including warming up and cooling down exercises. The muscular strength (Hand Grip Strength test) was selected as dependent variable 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 percentage 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 selected strength parameter. The difference between right and left hand on muscular strength is significant. However, the percentage of improvement for the variable was in-favor of right hand compared to left. Hence, it was concluded that physical training may be given to improve the dexterous (use of hands) level and quality.

Keywords: physical training, maximum strength, dextrality, sinistrality

Introduction
The adaptive response by the physiological system of the body to physical training, including the neuromuscular system are 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 which 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 strength. 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) [4].

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) [1]. 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. Strength is inherent capacity to manifest energy. Handedness in sports plays vital role on performing skills.

In handball the entire play was in dominance with hand movement and the motor control over neuromuscular coordination with the arm and hand.

Handedness is an attribute of humans defined by their unequal distribution of fine motor skill between the left and right hands. An individual who is more dexterous with the right hand is called right-handed (sinistralists), and one who is more skilled with the left is said to be left-handed (dextralists). Minorities of people are equally skilled with both hands, and are termed ambidextrous (Kabbash, P, 1994) [5].

Methodology

For the propose 30 right hand dominance boy students from Nagappatinam district, Tamilnadu, India were selected as subjects at random and their age range between 12-14 years, the selected subjects were divided in to three equal groups of ten subjects each namely dextrality physical training group (n=10), sinistrality physical training group (n=10), and combined dextrality and sinistrality physical training group (n=10). 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 muscular strength (Hand Grip Strength test) was selected as dependent variable 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 percentage was also calculated to find out the level of improvement on dexterous. Level of confidence was fixed at 0.05.

Results

Table 1: Independent 't' test between pretest and posttest data of muscular strength among under – 14 boys

Group	Test	Mean	SD	df	't' Ration	P-Value	Magnitude of improvement in %
Dextrality	Pre	27.40	0.70	18	12.28*	0.00	12.77%
	Post	30.90	0.57				
Sinistrality	Pre	27.70	0.48	18	7.18*	0.00	7.58%
	Post	29.80	0.79				
Ambidexterity (Dextrality)	Pre	27.30	0.82	18	13.99*	0.00	15.75%
	Post	31.60	0.52				
Ambidexterity (Sinistrality)	Pre	23.20	0.92	18	7.78*	0.00	12.50%
	Post	6.10	0.74				

*Significant at 0.05 levels.
The table value for df 18 is 1.73 at 0.05 level of confidence

Table 2: Analysis of covariance of pretest and post test data on isolated and combined dextrality muscular strength among under – 14 handball players

Test		Isolated Dextrality Group	Combined Dextrality Group	SOV	SS	df	MS	'F' Ratio
Adjusted Post Test	Mean	30.89	31.60	B	2.546	1	2.546	8.559*
				W	5.056	17	0.297	

* Significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence for 1 and 17 is d 4.45 respectively).

Table 3: Analysis of covariance of pretest and post test data on isolated and combined sinistrality muscular strength among under – 14 handball players

Test		Isolated Sinistrality Group	Combined Sinistrality Group	SOV	SS	df	MS	'F' Ratio
Adjusted Post Test	Mean	28.59	27.306	B	0.73	1	0.73	1.598
				W	7.712	17	0.45	

* Significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence for 1 and 17 is d 4.45 respectively).

The table II shows that there was a significant difference between the adjusted posttest means of isolated dextrality physical training group and combined dextrality physical training group on muscular strength. Therefore, the isolated and combined dextrality physical training indicates the different. The table III shows that there was a significant difference between the adjusted posttest means of isolated sinistrality physical training group and combined sinistrality physical training group on muscular strength. Therefore, the isolated and combined sinistrality physical training indicates the similar advance. To find out the improvement on dexterous level, independent 't' ratio was calculated with the magnitude of improvement(%).

The result of the 't' shows, significant difference between pretest and posttest mean on reaction speed. The magnitude of improvement was higher for right hand when compared to left hand on muscular strength. Hence, it was concluded that the selected physical training improves the dexterous level.

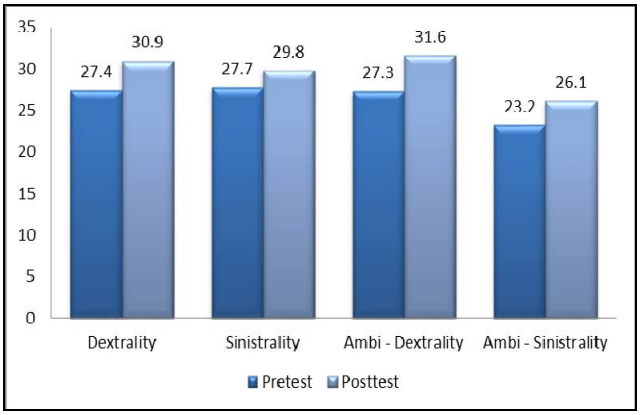

Fig 1: Shows pretest and Prottest

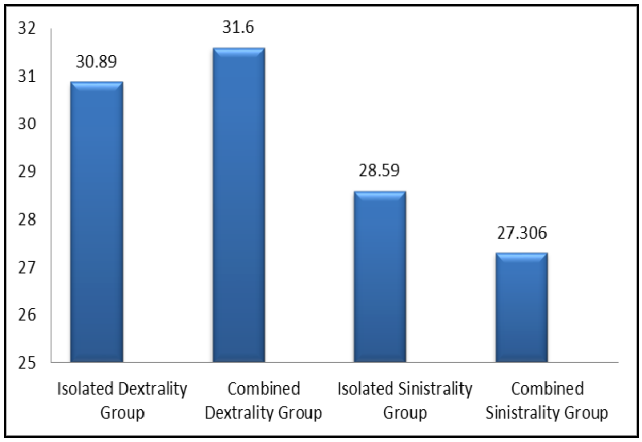

Fig 2: Shows Isolated dextrality group, Combined dextrality group, Isolated Sinistrality group and Combined sinistrality group.

Discussion

The findings confirm that physical training has a significant impact on strength. The following findings of different researches were in conformity with this study. (Lucy Hodges, Jo Adams 2007) [7], 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) [6], Conducted a study on Grip strength, an effect of hand dominance. This study 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 left-handed subjects exhibited no such difference in either elbow position. (Crosby, C. A., & Wehbe, M. A 1994) [2]. 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) [8]. (Zatsiorsky, V.M, 1995), 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. The excessive maximum strength training can impair speed-strength (Verkhoshansky, Y. 1986) [8]. Men and women were compared on dexterous on writing and throwing performance. The result confirms a decrease with age in the prevalence of sinistrality, but indicates that age-specific rates of mixed and left hardness are distinct (Gilbert An, Wysocki CJ 1996) [3].

Conclusion

It was concluded that the physical training improves muscular strength of dexterous (Hands). Hence, the dominant hand shows better improvement on maximum strength. Hence, non-dominant has also improves strength when compared to base level.

Implication

The result of the study gave an idea about the physical training on dexterity. If an individual having better dexterity, they can able to do any sort of work with both hands simultaneously without having any tired. The finding of the study helpful to the coaches and physical educationist to enhance the dexterity of 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 the competition.

Reference

1. Brookfield John. The Grip Master's Manual. A Journal for Serious Strength Athletes," Volume 1, Number 4. January 1994, pp. 25-26.
2. Crosby CA, Wehbe MA. Hand strength Normative values. Journal of Hand Surgery 1994;19A,665-670.
3. Gilbert An, Wysocki CJ. Hand preference and age in the United States. Neuropsychologia, Givaudan-roure Corporation Teaneck, New Jersey, Jul 1996;30(7):601-8.
4. Guiard Y. Asymmetric division of labor in human skilled bimanual action: The kinematic chain as a model". Journal of Motor Behavior 1987;19(4):486–517.
5. Kabbash P, Buxton W, Sellen A. Two-Handed Input in a Compound Task. Proceedings of CHI '94 1994, 417-423.
6. Incel NA, *et al*. Grip strength: effect of hand dominance". Singapore Med J 2002;43:234-237
7. Lucy Hodges, Jo Adams. Grip Strength and Dexterity: A Study of Variance between Right- and Left-Handed Healthy Individuals, British Association of Hand Therapists 2007;12:15-21
8. Verkhoshansky Y. Fundamentals of Special Strength Training in Sport". Livonia, MI: Sportivny Press. (Original work published in 1977, Moscow, Russia: Fizkultura i Spovt) 1986.