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Effects of Isotonic Strength Training on Selected Strength Parameters of Handball Plyers (A Pilot Study)

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ABSTRACT

Handball is an ideal synthesis of three fundamental athletic disciplines of running, jumping and throwing. A programmed called isotonic strength training comprises strength parameters created expressly to improve athletic performance. Training programmed for improving strength parameters may target strength like leg strength, core strength, lower back strength and lower body strength endurance, and other game-isotonic strength training, as well as speed strength, starting strength, maximum strength, and explosive strength. The idea of the study was to find out the isotonic strength training on strength parameters of college level men handball players through isotonic strength training. To achieve the purpose of the study, five college level men handball players would be randomly selected from Bharathiar university, Coimbatore district and their age ranged between 18 and 25 year men. Single group design was used. All strength parameters were assessed by standard tests; leg strength by wall squat test, core strength by plank test, lower back strength by back extensions test and lower body strength endurance by agility hurdle jump test. Isotonic strength training pilot study group (n = 5) would be undergone for a period of four weeks. The results revealed that there was a significant difference found on the criterion variables. The difference was found due to isotonic strength training given to the experimental group on leg strength, core strength, lower back strength and lower body strength endurance of college level handball men players.

KEYWORDS: Isotonic strength training, leg strength, core strength, lower back strength and lower body strength endurance, and Handball Players.

INTRODUCTION

Isotonic strength training for strength and conditioning professionals, and it includes a comprehensive discussion of isotonic strength training. The authors explain the principles of isotonic training and provide practical recommendations for designing and implementing effective isotonic training programs. The book covers various aspects of isotonic training, including exercise selection, load and repetition schemes, periodization, and progression. It also discusses the physiological adaptations that occur with isotonic training, such as improvements in muscular strength, power, and endurance. **N. Travis Triplett (2015).** Overall, this book provides a thorough overview of isotonic strength training and its benefits for athletes and fitness enthusiasts. It is a valuable resource for anyone interested in incorporating isotonic training into their exercise routine or training program. The training programmed should be particularly created based on the components that are needed for the talent or technique in sport when it comes to players who are at a higher level or above the basic level. Consequently, a player needs this kind of particular Isotonic strength training for success in sports. Thus, the present study has been carries out to study the isotonic strength training on strength parameters of college level men handball players through isotonic strength training.

METHODOLOGY

The idea of the study was to find out the effects of isotonic strength training on strength parameters of college level men handball players. To achieve the purpose of the study, five college level men handball players would be randomly selected from Bharathair university, Coimbatore district and their age ranged between 18- and 25-year men. Single group design was used. All strength parameters were assessed by standard tests; leg strength by wall squat test, core strength by plank test, lower back strength by back extensions test and lower body strength endurance by agility hurdle jump test. Isotonic strength training pilot study group (n = 5) would be undergone for a period of four weeks.

CRITERION MEASURES

The subjects of isotonic strength training pilot study would be assessed on the selected strength parameters by the standardized test items before and after the training period of four weeks.

Table-I

S. No	Criterion Variables	Test Items	Unit of Measurements
Strength Parameters			
1	Leg Strength	Wall squat test	In Seconds
2	Core Strength	Plank test	In Seconds
3	Lower Back Strength	Back extensions test	In Counts
4	Lower Body Strength Endurance	Agility hurdle jump test	In Counts

TRAINING PROGRAMME

The total duration of isotonic strength training. The load was increased one in two strength parameters progress and lasted for 60 minutes. During the training period the subject were treated with isotonic strength training for three alternative days (Monday, Wednesday, Friday) per week. During the four weeks of isotonic strength training, strength parameters the subjects were treated with warm up for 15minutes. Followed by isotonic strength training namely pushups, squats, Russian twists, supermans, burpees, side plank, tree pose, chair pose, lunge hold, bridge, bird dog, knee to chest, bicep curls 45 seconds. Further the session ended with warming down for 10minutes.

STATISTICAL TECHNIQUES

The data are analyzed by paired 't' test was used for assessed the effects of isotonic strength training on strength parameters of college level men handball players. The significance level was fixed at 0.05 level of confidence which is considered to be the appropriate one for this study.

RESULTS

Table-II

Relationship of Mean, SD and't'-Values of Strength Parameters between Pre & Post Test of the Isotonic Strength Training of Handball Players

	Variables	Test	Mean	S.D	't' values
Isotonic strength training	Leg Strength	Pre test	51.47	4.62	6.01*
		Post test	53.02	4.83	
	Core Strength	Pre test	44.38	3.15	4.47*
		Post test	46.15	3.06	
	Lower Back Strength	Pre test	16.60	2.60	9.79*
		Post test	19.00	2.54	
	Lower Body Strength endurance	Pre test	29.80	4.96	9.48*
		Post test	32.80	4.81	

*Significant at 0.05 level of confidence

Table-II reveals that the obtained mean values of pretest and post test scores of isotonic strength training group were 51.47 and 53.02, 44.38 and 46.15, 16.60 and 19.00 and 29.80, 32.80 respectively; the obtained t ratio was 6.01, 4.47, 9.79 and 9.48. The required table value is 2.77 at 0.05 level of confidence for the degree of freedom 4. The obtained t ratio was greater than the table value. It is found to be significant changes in leg strength, core strength, lower back strength and lower body strength endurance of the handball players. The mean values on isotonic strength training group are graphically represented in figure-1.

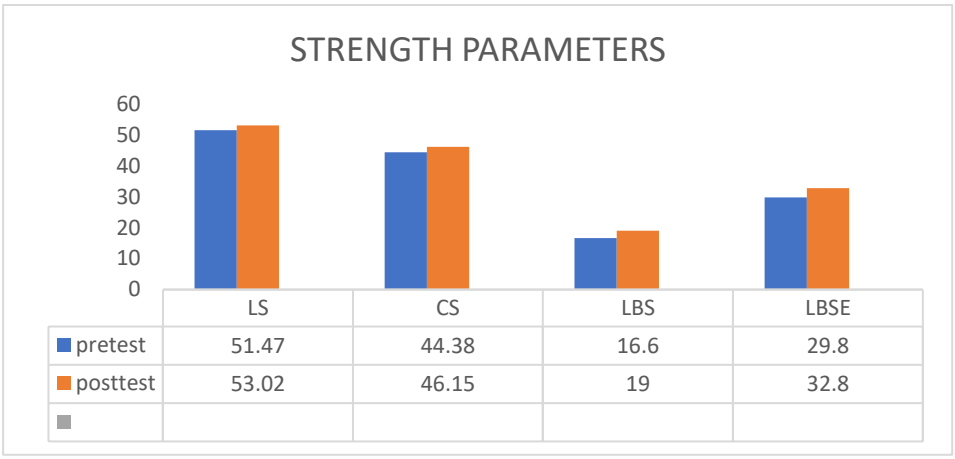

FIGURE-1: BAR DIAGRAM SHOWING THE PRE-TEST & POST-TEST ON STRENGTH PARAMETRES OF ISOTONIC STRENGTH TRAINING

DISCUSSION ON FINDINGS

Isotonic strength training is key to challenge, support and develop players. As we learn from all sports, marginal gains are key at the elite level and giving our players the best chance to be successful by preparing them for the game is vital. Allowing players to focus on their Isotonic strength training played on the pitch is incredibly important for a coach to identify their strength parameter and weaknesses, in order for sessions to be adjusted and tailored towards players needs so that developments are seen. The present-day study considered the influence of four weeks of Isotonic strength training on selected strength parameter of handball players. The results of this study designated that Isotonic strength training is more efficient to bring out desirable changes over the strength parameter of handball players. Investigators have extended their interest to consider the leg strength, core strength, lower back strength and lower body strength endurance commencement from the way a handball player approaches the Isotonic strength training.

The results of the present study indicates that the Isotonic strength training group significantly improved leg strength, core strength, lower back strength and lower body strength endurance of handball players. The results of the study are in line with the studies of **Saeterbakken., (2011), Spieszny., (2018) and Hermassi., (2019)**.

CONCLUSIONS

Based on the findings and within the limitation of the study it is noticed that practice of isotonic strength training helped to improve leg strength, core strength, lower back strength and lower body strength endurance of handball players at college level. It was also seen that there is progressive improvement in the selected criterion variables of isotonic strength training group of handball players after four weeks of isotonic strength training programme. Further, it also helps to improved leg strength, core strength, lower back strength and lower body strength endurance.

It was concluded that individualized effects of isotonic strength training group showed a statistically significant positive sign over the course of the four weeks treatment period on leg strength, core strength, lower back strength and lower body strength endurance of college level men handball players.

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