Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 7271-7274
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.05.821

EFFECT OF PLYOMETRIC TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES AMONG UNIVERSITY LEVEL HANDBALL PLAYERS

Dr.D.J.Asath Ali Khan, Assistant Professor, Department of Physical Education and Sports Sciences, SRM Institute of Science and Technology, College of Science and Humanities, Kattankulathur, Chengalpattu, Tamilnadu, India.
Mohammed Rashid, M.Phil Research Scholar, Department of Physical Education and Sports Sciences, SRM Institute of Science and Technology, College of Science and Humanities, Kattankulathur, Chengalpattu, Tamilnadu, India. rashisan0011@gmail.com

ABSTRACT- The aim of the study was to the effect of plyometric training on physical fitness performance among university level young men handball players. To achieve the purpose of the study university level handball players participated were randomly selected from in and around Kerala, and their age was ranged between 17 to 23 years. The subjects were randomly assigned into two equal groups (n=15). All the subjects were divided in to two groups with 15 subjects each as experimental and control group. Group-I underwent plyometric training exercises for a period of 6 weeks and group-II acted as control who did not participate in any special training other than the regular routine. The fitness variables such as speed and agility were selected as dependent variables. Speed was tested by 50mts (Dash) in seconds and Agility was tested by t-test mts shuttle run. The dependent 't' test was applied to determine the difference between the means of two groups. To find out whether there was any significant difference between the experimental and control groups. To test the level of significant of difference between the means 0.05 level of confidence was fixed. ***Results:*** The result of the study shows that, there was a significant improvement takes place on Speed and Agility of university level men handball players. ***Conclusions:*** Improved of Leg explosive power and Speed after regular plyometric training is beneficial for university level men handball players. Therefore plyometric training covered in this study are beneficial for the handball players.

Keywords: Plyometric Training, Physical Fitness, Handball Players.

I. INTRODUCTION:

Handball is distinguished by short bursts of high-intensity effort. Low-intensity phases alternate with high-activity phases [1,2]. Although the majority of a match is spent at a lower intensity, the most decisive actions, such as throwing, jumping, accelerating, sprinting, and tackling, necessitate high levels of explosiveness and strength [3-5]. As a result, resistance training should be included in pragmatic conditioning programs to promote these characteristics. The benefits of strength training are numerous (e.g., plyometrics, isomet-rics, dynamics, and isokinetic training). Other options include dynamic strength training combined with variable resistance, such as weight training (upper body weight training and lower body weight training) and weight lift chains [6-10].There is a lot of scientific evidence that dynamic strength training combined with elastic resistance can help athletes improve their limb strength performance [6-14]. SSC is intuitively logical to include in handball training because handball players frequently throw, push, jump, sprint, and change direction. Furthermore, several studies have shown that loaded weight training with other types of resistance improves athletic performance. In fact, Lyttle et al [15]. In adult male athletes, 8 weeks of biweekly loaded plyometric training (weighed bench press throw at 30% 1RM) resulted in an increase in one-repetition maximum (1RM) bench press and medicine ball throw performance. Furthermore, Khalifa et al [16]. Described improved jump performance in elite male basketball players after 10 weeks of loaded weight training (weight vest).However, the equipment used in these studies for loaded weight training was more expensive, heavy, and sophisticated than elastic resistance, such as the elastic band, which is prohibitively expensive for some athletes. To the best of our knowledge, no previous research has investigated the effects of plyometric training on selected physical fitness variables among university level men handball players.

II. METHODS:

The purpose of the study was to find out the effects of plyometric training on selected physical fitness variables among university level men handball players. To achieve the purpose of the study, thirty university level men handball players were selected from in and around Kerala. The subjects were randomly assigned in to two equal groups namely, Plyometric training group (PTG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 5 days per weeks (alternate days) for the training period of six weeks. The control group was not given any sort of training except their routine. Design: The fitness variables such as leg speed and agility were selected as dependent variables. Speed was tested by 50mts (Dash) in seconds and agility was tested by t-test mts shuttle run.

III. STATISTICAL ANALYSIS:

The collected data before and after training period of 6 weeks on the above said variables due to the effect of plyometric training was statistically analyzed with dependent 't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. (P<0.05)

Table - I

COMPUTATION OF 'T' RATIO ON SELECTED PHYSICAL FITNESS VARIABLES AMONG HANDBALL PLAYERS CONTROL GROUP AND EXPERIMENTAL GROUP

Group	Variables		Mean	N	Std. Deviation	Std. Error Mean	t ratio
Experimental Group	Speed,	Pre	7.82	15	0.50	0.00	13.03*
		Post	7.76	15	0.51		
	Agility,	Pre	8.96	15	0.99	0.071	4.54*
		Post	8.63	15	1.06		
Control group	Speed,	Post	7.77	15	0.48	0.47	1.68
		Pre	7.85	15	0.45		
	Agility,	Post	8.90	15	0.96	0.003	1.33
		Pre	8.90	15	0.97		

*Significant level 0.05 level degree of freedom (2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and 't' ratio on selected physical fitness parameters namely speed and agility experimental group. The obtained 't' ratio speed and agility were 13.03, and 4.54 respectively. The required table value was 2.14 for the degrees of freedom 1and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant. Further the computation of mean, standard deviation and 't' ratio on selected physical fitness namely Speed and Agility control group. The obtained 't' ratio on Speed and Agility were 1.68, and 1.33 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.

IV. DISCUSSION FINDINGS:

The present study experiment the effect of plyometric training on physical fitness parameters of university level men handball players. The result of the study indicated that the plyometric training improved the physical fitness parameters such as speed and agility.

The findings of the present study had similarity with the findings of the investigations referred in this study. However, there was a significantly changes of subjects in the present study the speed and agility

was significantly improved of subject in the group may be due to the in low intensity plyometric training. K.Devaraju et al., (2014) reported that twelve impact of low intensity plyometric training, the group improved significantly on all functional fitness components. Vairavasundaram et al., (2014) showed that significant improvement in all the selected physical variables namely agility, explosive power, muscular strength endurance and flexibility among handball players. Collectively, it appears that, from a theoretical standpoint, the inclusion of cluster set configurations has the potential to alter the training stimulus and ultimately magnify the adaptive response.

V. CONCLUSIONS:

There was a significant improvement takes place on selected physical fitness due to the effect of six weeks plyometric training. There was a significant difference exists between experimental and control groups on selected physical fitness variables such as speed and agility. Therefore plyometric training included in this study are helpful for the university level men handball players.

Author Contributions: AAK and MR designed the concept and conducted the study comple the raw data, does statistical analysis, generate the results and drafted the manuscripts. All authors have read and agreed to the published version of the manuscript.

Funding: The research received no funding or support from any of the agencies

Conflicts of Interest: The authors declare no conflict of interest.

Ethical approval: Not applicable

Availability of data: All available data has been presented in the study.

Acknowledgments: Authors wish to thank Dr.R.Mohanakrishnan, Associate Director of Sports, HOD, Department of Physical Education and Sports Sciences, College of Science and Humanities, Kattankulathur, Chengalpattu, Tamilnadu, India for his support towards research.

REFERENCE:

1. Chelly, M.S.; Hermassi, S.; Aouadi, R.; Shephard, R.J. Effects of 8-week in-season plyometric training on upper and lower limbperformance of elite adolescent handball players.J. Strength Cond. Res.2014,28, 1401–1410. [CrossRef]
2. Povoas, S.; Seabra, A.; Ascensao, A.; Magalhaes, J.; Soares, J.; Rebelo, A. Physical and physiological demands of elite teamhandball.J. Strength Cond. Res.2012,26, 3366–3376. [CrossRef] [PubMed]
3. Bayios, I.A.; Anastasopoulou, E.M.; Sioudris, D.S.; Boudolos, K.D. Relationship between isokinetic strength of the internal andexternal shoulder rotators and ball velocity in team handball.J. Sports Med. Phys. Fit.2001,41, 229–235.
4. Chelly, M.S.; Ghenem, M.A.; Abid, K.; Hermassi, S.; Tabka, Z.; Shephard, R.J. Effects of in-season short-term plyometric trainingprogram on leg power, jump- and sprint performance of soccer players.J. Strength Cond. Res.2010,24, 2670–2676. [CrossRef][PubMed]
5. Ortega-Becerra, M.; Pareja-Blanco, F.; Jimenez-Reyes, P.; Cuadrado-Penafiel, V.; Gonzalez-Badillo, J.J. Determinant Factors ofPhysical Performance and Specific Throwing in Handball Players of Different Ages.J. Strength Cond. Res.2018,32, 1778–1786.[CrossRef]
6. Anderson, C.E.; Sforzo, G.A.; Sigg, J.A. The effects of combining elastic and free weight resistance on strength and power inathletes.J. Strength Cond. Res.2008,22, 567–574. [CrossRef]
7. Bellar, D.M.; Muller, M.D.; Barkley, J.E.; Kim, C.H.; Ida, K.; Ryan, E.J.; Bliss, M.V.; Glickman, E.L. The effects of combined elastic-and free-weight tension vs. free-weight tension on one-repetition maximum strength in the bench press.J. Strength Cond. Res.2011,25, 459–463. [CrossRef]
8. Joy, J.M.; Lowery, R.P.; Oliveira de Souza, E.; Wilson, J.M. Elastic Bands as a Component of Periodized Resistance Training.J.Strength Cond. Res.2016,30, 2100–2106. [CrossRef]
9. Rhea, M.R.; Kenn, J.G.; Dermody, B.M. Alterations in speed of squat movement and the use of accommodated resistance amongcollege athletes training for power.J. Strength Cond. Res.2009,23, 2645–2650. [CrossRef]

10. Schabort, E.J.; Hopkins, W.G.; Hawley, J.A. Reproducibility of self-paced treadmill performance of trained endurance runners.Int.J. Sports Med.1998,19, 48–51. [CrossRef]
11. Paditsaeree, K.; Intiraporn, C.; Lawsirirat, C. Comparison Between the Effects of Combining Elastic and Free-Weight Resistanceand Free-Weight Resistance on Force and Power Production.J. Strength Cond. Res.2016,30, 2713–2722. [CrossRef]
12. Shoepe, T.C.; Ramirez, D.A.; Rovetti, R.J.; Kohler, D.R.; Almstedt, H.C. The Effects of 24 weeks of Resistance Training withSimultaneous Elastic and Free Weight Loading on Muscular Performance of Novice Lifters.J. Hum. Kinet.2011,29, 93–106.[CrossRef]
13. P Kumaravelu and K Govindasamy. Efficacy of SAQ drills on selected bio-motor abilities among inter collegiate athletes. International Journal of Yogic, Human Movement and Sports Sciences. 2018; 3(1): 160-161.
14. Kumaravelu P, Govindasamy K. Impact of circuit resistance training on leg strength among University players from different discipline. International Journal of Yogic, Human Movement and Sports Sciences. 2018; 3(1):158-159.: https://doi.org/10.22271/yogic.2018.v3.i1c.08.
15. Lyttle, A.D.; Wilson, G.J.; Ostrowski, K.J. Enhancing Performance: Maximal Power vs. Combined Weights and PlyometricsTraining.J. Strength Cond. Res.1996,10, 173–179. [CrossRef]
16. Khlifa, R.; Aouadi, R.; Hermassi, S.; Chelly, M.S.; Jlid, M.C.; Hbacha, H.; Castagna, C. Effects of a plyometric training programwith and without added load on jumping ability in basketball players.J. Strength Cond. Res.2010,24, 2955–2961. [CrossRef][PubMed]
17. Chelly, M.S.; Hermassi, S.; Aouadi, R.; Khalifa, R.; van den Tillaar, R.; Chamari, K.; Shephard, R.J. Match analysis of eliteadolescent team handball players.J. Strength Cond. Res.2011,25, 2410–2417. [CrossRef]
18. Hermassi, S.; Chelly, M.S.; Fathloun, M.; Shephard, R.J. The effect of heavy- vs. moderate-load training on the development ofstrength, power, and throwing ball velocity in male handball players.J. Strength Cond. Res.2010,24, 2408–2418. [CrossRef]
19. Hermassi, S.; Chelly, M.S.; Tabka, Z.; Shephard, R.J.; Chamari, K. Effects of 8-week in-season upper and lower limb heavyresistance training on the peak power, throwing velocity, and sprint performance of elite male handball players.J. Strength Cond.Res.2011,25, 2424–2433. [CrossRef]