

The Effect of Land and Aquatic Plyometric Training on Vital Capacity among College men Athletes

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Abstract

The purpose of the study was explored to find out the land and aquatic plyometric training on vital capacity among college men athletes. For the purpose of the study, forty five (n=45) men college athletes from Pudukkottai, Tamilnadu, India during the year 2019-2020 were selected as subjects. Their ages were from 18 to 21 years. The selected participants were divided at random into three groups of fifteen each (n=15). Group-I underwent land plyometric training, group-II aquatic plyometric training, and group-III acted as control group. The duration of the training period was restricted to eight weeks and the number of sessions per week was confined to five. The selected variable vital capacity was assessed by wet spirometer. The data were collected prior to and immediately after the training period of twelve weeks. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with analysis of covariance (ANCOVA). Whenever the 'f' ratio for adjusted post test means was found to be significant, the scheffe's post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases. The results of the study showed that aquatic plyometric training group is better than land plyometric training group and control group on improving vital capacity.

Key words: Land Plyometric Training, Aquatic Plyometric Training, Vital Capacity

1. INTRODUCTION

Sports trainings are an essential arrangement of sportsman for better execution through physical exercise. It depends on logical standards of focusing on training and execution upgrade, the improvement of general wellbeing and natural capacities just as expanding the quality and soundness of the musculo-skeletal framework (Singh, 1991).

Plyometrics is the term currently applied to practices that have their underlying foundations in Europe, where they were first referred to just as hop training. (Baechle, 2008). Plyometric training can take numerous structures, including hop training for the lower limits and medication ball practices for the furthest points. Hop training practices were characterized by the relative requests they put on the competitor. All the activities are dynamic in nature, with a scope of low to high power in each sort of activity.

Plyometric training empowers a muscle to arrive at maximal power in the most limited time conceivable, subsequently being a helpful technique for training for those exercises that require dangerous and incredible developments in a brief term of time. Plyometric practice is characterized as a brisk, incredible development utilizing a pre stretch, or countermovement that consolidates the stretch-shortening cycle (SSC). The SSC comprises of three stages: capricious, amortization, and concentric. The amortization stage, the time between the offbeat and concentric stages, is viewed as when the feet reach the ground and is additionally the most vital stage in taking into consideration maximal power creation (Baechle and Earle, 2008).

Water wellness action is an activity that is acted in the water, which advances and upgrades physical and mental wellness. Water wellness is among the most famous and generally endorsed wellness exercises since it has all the earmarks of being reasonable for various gatherings: more established, harmed, and even solid individuals (Benelli et al., 2004). Water practice programs had a tremendous advantage in the improvement of physical wellness and are qualities for each physical wellness segments (Barbosa et al., 2009). The thickness of water is roughly multiple times that of air, this has a significant commitment to the vitality cost of water work out (Prampero, 1986).

Individuals of assorted capacities can profit by practicing in water since water is an entirely unexpected medium to air, and practicing in the water is physiologically deferent from practicing in the land. A key point is that individuals are for all intents and purposes weightless when they are standing chest high in water. On account of oceanic exercise, there is a fundamental certainty that a given volume of water weighs around multiple times more than a similar volume of air. This distinction in relative thickness among water and air is answerable for water being the kinder and progressively adaptable medium where to work out (Glenda, 1998).

2. LITERATURE REVIEW

Ozen et al., (2020) explored the impact of plyometric training on sand and wooden parquet training surfaces on the physical exhibition parameters of youthful male ball players. Twelve very much prepared youthful male basket ball players with age 17.58 ± 0.5 years, weight 87.73 ± 9.82 kg, and tallness 193.75 ± 7.02 cm were willfully associated with the examination. All members were gathered arbitrarily as sand and wooden training gatherings. A six-week plyometric training program was performed on the sand and wooden parquet surfaces. Anthropometric estimations and physical execution tests; vertical and standing long bounce, box dexterity, and 30m run tests were performed. Information were gathered when a month and a half of plyometric training and were investigated utilizing ANCOVA. The outcomes showed that the plyometric training program fundamentally improved bouncing, deftness and 30m run execution for the two gatherings. Huge contrasts were found between the post-test mean estimations of two gatherings in the container drill nimbleness and 30m run test scores ($p < .05$). The after effects of this investigation propose that while the plyometric training performed on a wooden or sand surface doesn't cause an alternate impact on the improvement of bouncing execution, plyometric training on the sand surface might be a progressively viable training surface to improve the spryness and run execution of youthful players.

Taghread et al., (2019) decided if sea-going training and Non-oceanic training can improve oxygen consuming wellness, and physical readiness in more youthful ball player. Eighteen b-ball players (age=17.49±0.53 years, body mass=67.37±1.17 kg, height=179.30±1.46 cm, sport experience=3.40±0.36 years) take an interest right now. The members were arbitrarily doled out to amphibian training gathering (AQT n=9) or Non-oceanic training gathering (NQT n=9) to perform two months of sea-going Non-sea-going activity twice week by week for 45 min, both notwithstanding customary preseason ball training . The activities included force skips, spike approaches, single-and twofold leg bouncing, constant hopping for stature, squat hops with blocking structure, and profundity hops. B-ball players were evaluated when eight-week training period on VO_{2max}, 20 m dash, vertical bounce, set and arrive at adaptability, 1RM leg press and twist up, readiness T-test. The outcomes indicated that the two gatherings made fundamentally upgrades in all factors however the (AQT) made altogether enhancements more noteworthy than (NQT). We reason that the sea-going activities brought about bigger upgrades in oxygen consuming wellness, VJ, dash, adaptability, dexterity, quality and continuance than in the NQT gathering.

Sporri et al., (2018) analyzed the impact of a novel training intercession on vertical solidness and athletic execution. Vertical solidness, bounce execution and athletic execution were evaluated in two arbitrarily apportioned gatherings, preceding, and following, an eight-week time frame. One gathering was presented to a preparation mediation including water based plyometrics (n = 11) over the two months while the other went about as a benchmark group (n = 9). The preparation intercession included bouncing, hopping and jumping in water at a profundity of 1.2m while control members played out their ordinary training. There were no huge changes in vertical solidness in either gathering. Countermovement hop tallness and pinnacle power essentially expanded inside the water plyometric gathering (p < 0.05). Athletic execution markers improved in the water plyometric bunch as estimated utilizing a readiness and a 5-bound test displaying prevalent qualities at the post-test (p < 0.05). The outcomes recommend that a water plyometric training system can upgrade athletic execution without raising solidness. The expansion in athletic execution is likely because of a decrease in ground response powers made by the lightness of the water, causing a shorter amortization stage and an increasingly fast use of concentric power. The discoveries from this investigation can advise practice experts and clinical staff in regards to the capacity to upgrade neuromuscular execution without raising vertical solidness. This has suggestions for improving athletic execution while simultaneously limiting injury chance.

Sporri et al., (2018), inspected the impact of a novel training intercession on vertical solidness and athletic execution. Vertical firmness, bounce execution and athletic execution were surveyed in two arbitrarily apportioned gatherings, before, and following, an eight-week time span. One gathering was presented to a preparation intercession including water based plyometrics (n = 11) over the two months while the other went about as a benchmark group (n = 9). The preparation mediation included bouncing, hopping and jumping in water at a profundity of 1.2m while control members played out their ordinary training. There were no critical changes in vertical solidness in either gathering. Countermovement bounce tallness and pinnacle power essentially expanded inside the water plyometric gathering (p < 0.05). Athletic execution markers improved in the water plyometric bunch as estimated utilizing a dexterity and a 5-bound test showing unrivaled qualities at the post-test (p < 0.05). The outcomes recommend that a water plyometric training project can improve

athletic execution without raising solidness. The expansion in athletic execution is likely because of a decrease in ground response powers made by the lightness of the water, causing a shorter amortization stage and an increasingly quick utilization of concentric power. The discoveries from this examination can advise practice experts and clinical staff in regards to the capacity to improve neuromuscular execution without raising vertical firmness.

3. METHODOLOGY

The study was conducted on forty five (N=45) men college athletes from Pudukkottai, Tamilnadu, India during the year 2019-2020 were selected as subjects. Their ages were from 18 to 21 years. The selected participants were divided at random into three groups of fifteen each (n=15). Group-I underwent Land Plyometric Training, Group-II Aquatic Plyometric Training, and Group-III acted as Control group. The duration of the training period was restricted to eight weeks and the number of sessions per week was confined to five. Vital Capacity only selected for this study and it was measured through wet spirometer. All the subjects were tested prior to and immediately after the training period of twelve weeks for all the selected variables.

The data collected data from the three groups prior to and immediately after the training programme on the selected criterion variables were statistically analyzed with Analysis of Covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, Scheffe's post hoc test was followed to determine which of the paired mean differences was significant. In all the cases .05 level of confidence was fixed to test.

4. RESULTS AND DISCUSSION

The analysis of covariance on vital capacity of the pre test, post test and adjusted post test on experimental groups and Control group have been analyzed and presented in Table -1.

Table – 1

Computation of Analysis of Covariance of Pre Test, Post Test and Adjusted Post Test on Vital Capacity of Experimental groups and Control group

Test	Land Plyometric Training Group	Aquatic Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	40.60	40.47	41.20	Between groups	4.58	2	2.29	0.59
				Within groups	163.73	42	3.90	
Post-Test Mean	44.33	47.27	41.40	Between groups	258.13	2	129.07	37.16*
				Within groups	145.87	42	3.47	
Adjusted Post-Test Mean	44.44	47.46	41.10	Between sets	296.95	2	148.47	87.78*
				Within Sets	69.35	41	1.69	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23

Table-1 shows that the pre test mean land plyometric training group, aquatic plyometric training group and control group on vital capacity were 40.60, 40.47 and 41.20 respectively. The of obtained F-ratio value of 0.59 for is less than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence. The post test mean land plyometric training group, aquatic plyometric training group and control group on Vital Capacity were 44.33, 47.27 and 41.40 respectively. The of obtained F-ratio value of 37.16 for is greater than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

Further the table-1 shows the adjusted post test mean land plyometric training group, aquatic plyometric training group and control group on vital capacity were 44.44, 47.46 and 41.10 respectively. The of obtained F-ratio value of 87.78 for is greater than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of land plyometric training group, aquatic plyometric training group and control group on vital capacity. Since, three groups are compared and whenever the obtained 'F' ratio for adjusted post test is found to be significant, Scheffe's test is used to find out the paired mean difference and it is presented in Table-2.

Table – 2

Scheffe's test for the difference between paired means on Vital Capacity

Land Plyometric Training Group	Aquatic Plyometric Training Group	Control Group	Mean Difference	Confident Interval Value
44.44	47.46	---	3.02*	1.21
44.44	---	41.10	3.34*	
---	47.46	41.10	6.37*	

**Significant at 0.05 level of confidence.*

Table-2 shows that the mean difference values of land plyometric training group and aquatic plyometric training group, land plyometric training group and control group, aquatic plyometric training group and control group are 3.02, 3.34 and 6.37 respectively, which are greater than the confidence interval value of 1.21 on Vital Capacity at 0.05 level of confidence.

The results of the study showed that there was a significant difference between land plyometric training group and aquatic plyometric training group, land plyometric training group and control group, aquatic plyometric training group and control group p.

The above data also reveal that aquatic plyometric training group had shown better performance than land plyometric training group and control group in vital capacity.

The pre and post mean values of land plyometric training group, aquatic plyometric training group and control group on vital capacity are graphically represented in the figure -1.

The adjusted post mean values of land plyometric training group, aquatic plyometric training group and control group on vital capacity are graphically represented in the figure -2.

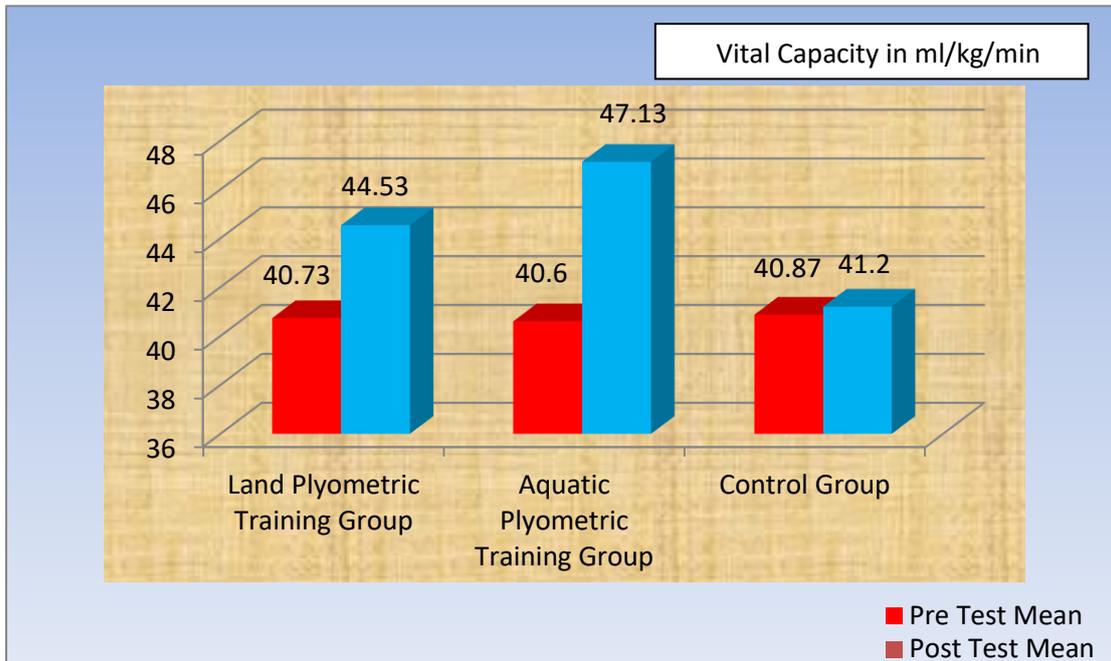


Figure-1: The pre and post mean values of land plyometric training group, aquatic plyometric training group and control group on vital capacity

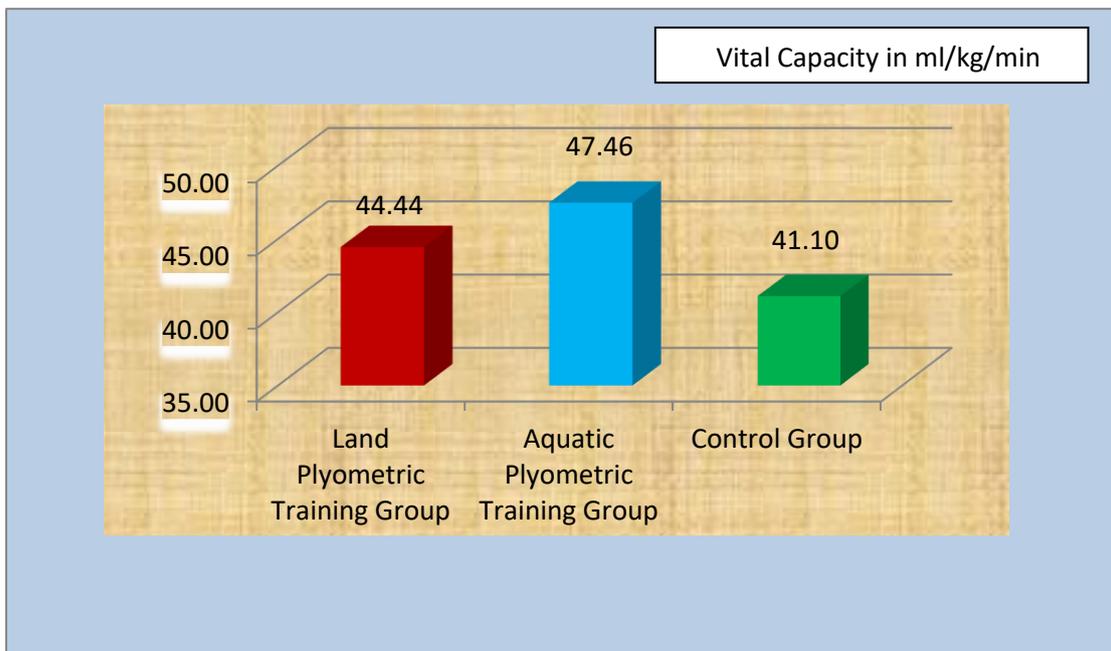


Figure-2: The Adjusted Post Mean Values of land plyometric training group, aquatic plyometric training group and control group on vital capacity

5. CONCLUSIONS

From the analysis of the data, the following conclusions were drawn. The experimental groups namely, land plyometric training and aquatic plyometric training had significantly improved in vital capacity. Significant differences in achievement were found among land plyometric training and aquatic plyometric training in vital capacity. The aquatic plyometric training was found to be better than the land plyometric training and control group in developing vital capacity.

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