

COMPARATIVE ANALYSIS OF PROGRESSIVE PLYOMETRIC TRAINING AND PROGRESSIVE PLYOMETRIC TRAINING FOLLOWED BY REVERSIBILITY ON SPEED

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ABSTRACT:

This study was designed to analyze the effect of progressive plyometric training and progressive plyometric training followed by reversibility on Speed. To achieve the purpose of this study, 45 men students from bachelor's degree course in the branch of physical instruction and games sciences, Acharya Nagarjuna University Ongole Campus, Ongole, Andhra Pradesh, India were selected as subject. The subject were assigned at random into three groups of fifteen each (n=15). Group I underwent progressive plyometric training, Group II underwent progressive plyometric training followed by reversibility and Group III acted as control. Control group was restricted to participate in any specific training. The stride frequency was selected as dependent variable. The pre and post test random group design was used as experimental design. The collected data from the three groups prior to and immediately after the training programme on selected criterion variables was statistically examined for significant difference, if any, by applying analysis of covariance (ANCOVA). Since three gatherings were included at whatever point the "F" proportion was observed to be critical for balanced means, Scheffe's test was taken after as a post hoc test to figure out which of the combined means contrast was huge. The outcomes of the reveals that due to the influence of progressive plyometric training (2.94%) and progressive

plyometric training followed by reversibility (2.90%) the anaerobic power was significantly improved. It is also concluded that progressive plyometric training followed by reversibility group is significantly better than progressive plyometric training followed by reversibility group in improving Speed.



KEYWORDS:

Progressive plyometric training, Reversibility and Anaerobic power.

INTRODUCTION:

The human body is an astounding creation. Amid rest, endless occasions are happening at the same time in flawless co-appointment, permitting complex capacities, for example, seeing, hearing, noticing, tasting, breathing and thinking to proceed without cognizant exertion. The move from rest to practice is joined by considerable changes in various substantial capacities, permitting the body to effectively adjust to extra push. At the body encounters rehashed episodes of activity, for example, in a physical molding program, long haul adjustments happen in the body permitting higher execution levels without undue exhaustion and furnishing the body with an inclination and/or feeling of prosperity (Wilmore and Costill, 1988).

Individuals have reliably attempted to run quicker, hop higher, and show more prominent quality, perseverance and ability. We are actually aggressive and goal-oriented for brilliance in athletic exhibitions. As a consequence of down to earth

experience, perception and logical experimentation, old technique for molding however entrancing and rich in convention, have been disposed of and supplanted by new strategies in view of knowledge and comprehension. For a considerable length of time, this assessment towards better strategies for molding was moderate, yet in the late years the emotional changes that have occurred have realized some dumbfounding results in execution (Bourhcer and Malina, 1993). The significant target in preparing is to bring about natural adjustment so as to enhance execution in a particular errand. To upgrade physiological change viably and to realize a change, particular activities and over-burden must be taken after. By practicing at a level above typical, assortment of preparing adjustments occur in the body that makes it work all the more effectively. Various preparing strategies are practically speaking to enhance every single physical and engine wellness quality at different levels. These fundamental preparing techniques will serve better when used with alterations suited to the person. The best preparing system is what expands the coveted quality at a higher rate without bringing on undesirable impacts Boucher, C., and R.M.Malina(1993). Preparing speaks to a long haul Endeavour's. Competitors are not grew overnight and a mentor can't make supernatural occurrences by compromising through ignoring experimental and systematic theories. Tudor O.Bompa (1999).

On the off chance that a preparation routine is arranged and executed effectively, the consequence of orderly practice is change of the competitor's physical wellness, especially quality, as the body adjusts to physical burden. In a wide sense, the word adjustment implies the change of a life form to its surroundings. In the event that nature changes, the life form changes to better make due in these new conditions.

In Biology, adaptation is considered as one of the main features of living species. In Physical Education, exercise then again normal physical work is an intense boost for adjustment Veadimir M. Zatsiorsky(1995).

Physical preparing is one of the most important ingredients and in some cases the most important ingredient in training to achieve high execution. Te destinations of physical preparing are to expand the competitor's physiological potential and to create bio motor abilities to the highest standards Tudor O.Bompa(1999).

Most athletes now include strength and power training as important components of their overall training programmes, including female athletes, who were traditionally excluded from such training. Much of this attitude change is attributable to research that has proved the performance benefits of resistance training and to innovations in training techniques and equipment. Resistance training is now recognized as important even for non-athletes who seek the health related benefits of exercise Jack H. Wilmore and David L.Costill (1999).

Training adaptation takes place when the training load is above normal or the athlete is not accustomed to an activity. Preparing burdens are generally delegated animating holding and detraining loads. With a specific end goal to incite the required adjustment:

- 1.An exercise overload must be applied.
- 2.The exercises and training protocol must be specific (corresponding to the main sport exercise).
- 3.Both exercises and training load (intensity, volume) should vary when load is employed over a drawn out stretch of time and execution pick up diminishing (Accommodation).
- 4.Training projects must be balanced independently to every competitor. Coaches use simple models that are based on only the most essential features (Generalized theories of training).

The hypothesis of super remuneration, or one variable hypothesis, depends on the possibility that specific biochemical substances are drained as a consequence of preparing workouts. After the reclamation time frame, the level of the substance increments over the underlying level (super pay). On the off chance that the following workout happens amid the super pay stage, the competitor's readiness increments. In the wellness – weakness hypothesis (two-variable hypothesis), the quick impact after a

workout is viewed as a mix of (a) wellness pick up provoked by the workout and (b) exhaustion. The summation of positive and negative changes decides the last result. The impacts of preparing can be delegated intense, prompt, total, postponed, halfway or remaining. Despite the fact that an extraordinary mentor is dependably a craftsman in organizing a preparation framework, the game sciences are the hidden establishment of any effective preparing program. An outline of preparing science premise is the best beginning stage for each mentor who needs to be fruitful William J. Bowerman and William H. Freeman (1991).

Athletic execution has significantly advanced in the course of recent decades. Execution levels impossible before are presently normal and the quantity of competitors fit for exceptional results is expanding. One among the contributing components are that games is a testing field, and serious inspirations has empowered long, hard hours of work. Additionally, instructing has turned out to be more advanced, in part from the help of games experts and researchers. Sports sciences have advanced from illustrative to exploratory. A more extensive base of learning about competitors now exists, which is reflected in preparing approach (Bompa, 1999).

Most investigative information, whether as a matter of fact or exploration goes for to understanding and enhancing the impacts of activity on the body. Activity is currently the center of games science. Research from a few sciences improves the hypothesis and procedure of preparing, which has turned into its very own study. The competitor is the subject of the investigation of preparing. The competitor speaks to an incomprehensible wellspring of data for the mentors and games researchers.

The real goal in preparing is to bring about organic adjustment with a specific end goal to enhance execution in a particular undertaking. To upgrade physiological change adequately and to achieve a change, particular activities and overburden must be taken after. By practicing at a level above ordinary, assortment of preparing

adjustments happen in the body that makes it work all the more proficiently. Various preparing strategies are by and by to enhance every last physical and engine wellness quality at different levels. These essential preparing systems will serve better when used with changes suited to the person. The best preparing project is what expands the fancied quality at a higher rate without bringing about undesirable impacts (Boucher and Malina, 1993).

Any Physical action prompts anatomical, physiological, bio-substance and mental changes. The proficiency of a physical action results from its span, separation and reiterations, burden and speed and the recurrence of execution. While arranging the progression of preparing, consider these viewpoints, alluded to as the variables of preparing model, every one of these variables as indicated by the useful and mental qualities of an opposition. All through the preparation stages going before an opposition, characterize which part to underscore to accomplish the arranged execution objective.

Quality increases can be changed into force just by applying particular force preparing. Maybe a standout amongst the most energizing preparing advancements of the previous 25 years has been plyometric preparing. Similarly as with any preparation advancements there was much persona and some perplexity encompassing the technique. A lot of these happened, on the grounds that plyometrics was initially extended as a mystery Russian preparing strategy. As a general rule, plyometric preparing was not an especially new preparing technique, nor was it the selective space of the Russian game machine.

Plyometric preparing includes various preferences over conventional substantial weight preparing technique. Plyometric exercise has a tendency to be performed in a more unstable manner than conventional quality preparing. Thusly plyometric preparing requires the competitors to quickly create power, advancing the advancement of strong force. Dynamic full grown of plyometric preparing takes into consideration more noteworthy change in the maximal rate of power advancement, in contrast with customary weight preparing technique.

Plyometric exercise don't include an expansive deceleration stage amid concentric development, which happens in customary quality preparing , as the body does not need to accomplish zero speed toward the end of the activity. Along these lines Plyometric practices include the generation of high compel and speeding up all through the whole scope of movement, particular to most focused developments. Plyometric activities are performed at higher speeds than those accomplished utilizing conventional quality preparing. This expanded speed upgrades the specificity of the preparation methodology to aggressive execution, enhancing the transference of preparing additions to the focused circumstance.

METHODOLOGY

SUBJECTS AND VARIABLES

The reason for the study was to examine the impact of dynamic plyometric preparing and dynamic plyometric training followed by reversibility on Speed . To achieve the purpose of the study 45 male students studying bachelor's degree course in the department of physical education and sports sciences, Acharya Nagarjuna University Ongole Campus, Andhra Pradesh, India amid the scholastic year 2014-2015 were chosen as subjects indiscriminately by parcel strategy from total of 100 students. They were divided into three groups of fifteen each (n=15). Group I underwent progressive plyometric training, Group II underwent progressive plyometric preparing took after by reversibility and Group III went about as control. Control group was restricted to participate in any specific training. The purpose and nature and importance of experiment and testing periods were explained to the subjects. The data collected from the experimental and control groups as these students were new to plyometric training regime, the subjects cleared the minimum strength requirement test prescribed by Voight and Draovitch, which consisted of five push-ups, five squat thrust, standing long jump and skipping rope for thirty seconds.

TRAINING PROGRAMME

Amid the preparation time frame, the trial bunches experienced their individual preparing programs notwithstanding their normal physical training project of the course of study according to the educational modules. Bunch I had experienced dynamic plyometric preparing for three days for each week for twelve weeks and gathering II had experienced dynamic plyometric preparing for three days for each week for nine weeks and took after by reversibility for two days for every week for staying three weeks. The rule of over-burden for Group I had been connected at like clockwork up to the twelfth week to achieve the high force though Group II was accomplished the high power at the ninth week itself and after that for staying three weeks the heap was purposely lessened. The span of instructional meetings in all the days was between 45 minutes and a hour roughly, which included additionally warming up and limbering down. Bunch III went about as control who did not take an interest in a particular preparing keeping pace with trial bunches. Be that as it may, they performed the standard physical training system of the course of the study. The test bunches experienced their particular preparing programs amid night hours under strict supervision of the agent. To lessen the likelihood of harm the preparation was led on the meadow. The preparation plans for the exploratory gatherings were composed in light of the pilot study furthermore in view of the rules by Donald A.Chu.

STATISTICAL PROCEDURE

The pre and post test arbitrary gathering configuration was utilized as trial outline as a part of which forty-five men subjects were separated into three gatherings of fifteen each at irregular. No endeavor was made to liken the gathering's in any way. Bunch I experienced dynamic plyometric preparing and Group II experienced dynamic plyometric preparing took after by reversibility and Group III went about as control. The subjects were tried on chose model variable step recurrence before and instantly after the preparation program. The gathered information from the three gatherings

before and quickly after the preparation program on chose standard variables were measurably analyzed for critical distinction, assuming any, by applying examination of covariance (ANCOVA). Since three gatherings were included at whatever point the "F" proportion was observed to be noteworthy for balanced means, Scheffe's test was taken after as a post hoc test to figure out which of the matched means distinction was critical. Sizes of changes were figured for all the gatherings on chose basis variables independently as proposed by Jerry Thomas and Jack Nelson. In all cases .05 level was altered as level of certainty.

RESULT

The investigation of covariance on pace of dynamic plyometric preparing bunch, dynamic plyometric preparing took after by reversibility gathering and control bunch have been dissected and displayed in Table 1.

Table I

Analysis of covariance on Speed of progressive plyometric training group, progressive plyometric training followed by reversibility group and control group

	Progressive plyometric training group	Progressive plyometric training followed by reversibility group	Control group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F Ratio
Pre test	6.8	6.9	6.7	Between mean	0.510	2	0.255	1.16
Mean				Within group	9.240	42	0.220	
Post test	6.6	6.7	6.7	Between mean	0.080	2	0.040	0.19
Mean				Within group	8.636	42	0.206	
Adjusted Post test	6.6	6.4	6.8	Between set	0.570	2	0.285	20.36*
Mean				Within set	0.590	41	0.014	
Magnitude of Improvement	2.94%	2.90%	0%					

*Significant at .05 level of confidence. The table value required for significance at .05 level with df 2 and 42 and 2 and 41 are 3.22 and 3.23 respectively. (Speed performance in 1/10th of a second)

Table I demonstrates that the pre test mean estimations of rate for dynamic plyometric preparing bunch, dynamic plyometric preparing took after by reversibility gathering and control gathering are 6.8, 6.9 and 6.7 seconds individually. The acquired "F" proportion of 1.16 for pre test is not exactly the table estimation of 3.22 for df 2 and 42 required for essentialness at .05 level of certainty. The post test mean estimations of pace for dynamic plyometric preparing bunch, dynamic plyometric preparing took after by reversibility gathering and control gathering are 6.6, 6.7 and 6.7 seconds separately. The got "F" proportion of 0.19 for post test is not exactly the table estimation of 3.22 for df 2 and 42 required for importance at .05 level of certainty. The balanced post test mean estimations of pace for dynamic plyometric preparing bunch dynamic plyometric preparing took after by reversibility gathering and control gathering are 6.6, 6.4 and 6.8 seconds individually . The got "F" proportion of 20.36 for balanced post test is more than the table estimation of 3.23 for df 2 and 41 required for centrality a .05 level of certainty.

The extent of change of velocity because of the impact of the individual preparing method for dynamic plyometric preparing bunch, dynamic plyometric preparing took after by reversibility gathering and control gathering are 2.94%, 2.90% and 0% separately. The consequences of the study demonstrates that there is a huge distinction among the balanced post test method for dynamic plyometric preparing bunch, dynamic plyometric preparing took after by reversibility gathering and control bunch on the improvement of rate.

To figure out which of the three matched means had a huge contrast, Scheffe's test was connected as post hoc test and the outcomes are introduced in Table II.

Table II

Scheefe's test for the differenes between the adjusted post test paired means on speed

Adjusted Means			Mean Difference	Confidence Interval
Progressive plyometric training group	Progressive plyometric training followed by reversibility group	Control Group		
6.6	6.4	-	0.20*	0.11
6.6	-	6.8	0.20*	0.11
-	6.4	6.8	0.40*	0.11

*Significant at .05 level of confidence.

(Speed performance in 1/10th of a second).

Table II demonstrates that the balanced post test mean contrasts on velocity between dynamic plyometric preparing gathering and dynamic plyometric preparing took after by reversibility bunch, dynamic plyometric preparing gathering and control gathering and dynamic plyometric preparing took after by reversibility gathering and control bunch as 0.20, 0.20 and 0.40 individually. They are higher than the certainty interim estimation of 0.11 which demonstrates noteworthy distinction at .05 level of certainty.

It might be finished up from the aftereffects of the study that there is a noteworthy distinction between the balanced post test method for dynamic plyometric preparing gathering and dynamic plyometric preparing took after by reversibility bunch, dynamic plyometric preparing gathering and control gathering and dynamic plyometric preparing took after by reversibility gathering and control bunch on velocity.

The mean estimations of dynamic plyometric preparing bunch, dynamic plyometric preparing took after by reversibility gathering and control bunch on rate are graphically spoken to in Figure I.

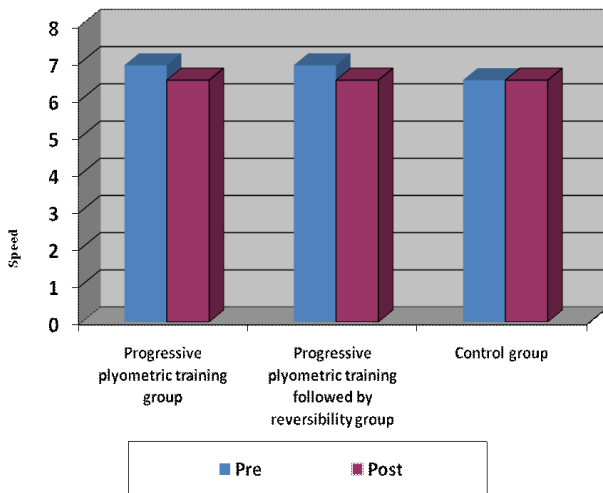


Figure I: Mean values of progressive plyometric training group, progressive plyometric training followed by reversibility group and control group on speed.

DISCUSSION

The consequences of the study shows that both the trial gathers to be specific dynamic plyometric preparing and dynamic plyometric preparing took after by reversibility bunches had essentially enhanced the chosen subordinate variable step recurrence when contrasted with the control bunch as it didn't take an interest in any of the extraordinary preparing program separated from the customary physical instruction exercises. As indicated by Wilson et al., (1994) plyometric preparing is utilized as a way to upgrade the strong quality and size, force, velocity and perseverance, improve muscle tone, and help with restoration damage counteractive action and to help in the support of solid capacity. These discoveries are likewise in concurrence with the discoveries of Brown et al., (1986) who led a study to discover the impacts of plyometric activities on 15 year old subjects in which plyometric bunch experienced noteworthy addition in Speed, stride recurrence and step length.

As indicated by Reddy, (1993) plyometric preparing expanded pace, stride length, stride recurrence and anaerobic force than that of the resistance preparing. Bompa (1999) tested and recommended that plyometric activity can regularly yield a critical addition in physical capacity and enhancement of athletic execution. Plyometric preparing impact the beginning force and speeding up force amid sprinting. Hatfield and Yessis (1998) bring up that plyometric exercise includes capable solid constriction because of the quick, dynamic stacking of the including muscles. The quick extending of these muscles initiates the muscle stretch reflex, which sends an effective jolt to the muscles making them contract quicker and with more power. The quicker a muscle is compelled to protract, the more prominent strain, it applies.

As indicated by Gehri et al., (1998) plyometric preparing system is the best to improve vertical hopping capacity, positive vitality generation and flexible vitality use. Admas et al., (1995) cited that plyometric preparing enhances hip and thigh power generation as measured by vertical bouncing capacity. Blakey, et al., (1987) inspected plyometric preparing enhances quality power an anaerobic force. Since, the likelihood of decreasing the time between constrained stretch at effect and start of compression was

enhanced by plyometric preparing. As indicated by Wagner et al., (1997) and Medbo et al., (1990) plyometric preparing is compelling for expanding lower body anaerobic force.

CONCLUSION

The consequences of the uncovers that because of the impact of dynamic plyometric preparing (2.94%) and dynamic plyometric preparing took after by reversibility (2.90%) the Speed was altogether made strides. It is likewise inferred that dynamic plyometric preparing took after by reversibility gathering is essentially superior to anything plyometric preparing took after by reversibility bunch in enhancing Speed.

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