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Effects of Core Plyometric Training on the Development of explosive Power of Inter Collegiate Handball Players

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Abstract

The purpose of the study is to investigate the effects of core plyometric training on the development of explosive power of inter collegiate handball players on coach rated handball skills in relation to selected physical fitness variables.To achieve the purpose of the present study 80 handball playerswere selectedfrom SSM Institutions, Namakkal at random.The selected variable wasExplosive Power.The collected data on criterion measures were treated by Standing Broad Jump apparatus, score sheet, sliding marker and measuring scale for Explosive Power. The collected data were statistically analyzed by t ratio, one ways analysis of variance test was applied and the level of significance for the study was 0.05 level. The collected data were statistically analysed by t ratio, one-way analysis of variance test was applied. The level of significance for the study used was 0.05 level. Wherever significant differences were found scheffe's post-hoc test was used. The results revealed that there was significant difference in the Explosive Power of Handball players. There was significant difference exist in their interaction effect in Explosive Power level among collegiateHandball players.

Keywords: Core training, Plyometric training,CcollegiateHandball players and Explosive Power.

Introduction

Plyometrics is a type of exercise training that uses speed and force of different movements to build muscle power. Plyometrics training can improve your physical performance and ability to do different activities. Plyometrics can include different types of exercises, like pushups, throwing, running, jumping, and kicking. Athletes often use plyometrics as part of their training, but anyone can do these workouts. People who are in physical rehab after an accident or injury use plyometrics to get back into good shape and physical function.If you're in good shape and looking to ramp up your workout, you may enjoy the challenge of plyometrics. It's a great way to train if you're into high-impact sports that involve a lot of running or jumping, like tennis, skiing, or basketball.

Core training is the strengthening and conditioning of the core muscles surrounding the middle of the body the abdomen, hips, pelvis, and lower back. These muscles protect the spine and are responsible for stabilizing and balancing the body during movement. Therefore, core training is sometimes referred to as core stabilization or balance training. Strong core muscles that contract appropriately are important for good posture and balance, and for the stability and mobility of the spine,

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rib cage, pelvis, and hips. Movement is more powerful and efficient with a strong core. Strong core muscles also give better definition to the superficial muscles of the trunk and can help prevent or reduce lower back pain and injuries.

Explosive power drills are often used by athletes who need to generate a quick burst of maximal effort, such as movements required in football, track and field sports, court sports and even cycling. The types of exercises used to build this quick, explosive power are movements that require a maximum or near maximum power output from the athlete in a short amount of time.Explosive exercise training routines are one way to increase power output. The goal of explosive exercise training is to ultimately move heavy weights very quickly. But to get to that point safely, without risking injury, it's important to start with light weights and slow controlled movements. Over a matter of training session (several weeks), but the weight lifted and speed at which it's lifted will be increased.Explosive exercises at their final level are often referred to as plyometric or ballistic movements.

Standard explosive exercises use large muscle movements such as squats, power cleans, weighted or unweighted vertical jumps, heavy ball throws or even hill sprinting. Smaller muscle exercises like bench presses or push-ups can also be used to build power but will limit the overall results to those muscle groups.

Reviews Related Litrature

Diallo, et al., (2000) concentrated on on the

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school population; stretch-shortening cycle practice (plyometric exercise) may be regularly utilized will enhance leg muscle control Furthermore verthandi bounce execution. Martel , et al. , (2005) examined ahead oceanic plyometric preparing builds verthandi bounce over female handball players various investigations need accounted for that land-based plyometrics camwood enhance bulky strength, joint stability, What's more verthandi bounce (VJ) done Competitors. Hertogh , et al. , (2002) mulled over around hop assessment about world class handball players utilizing two methods: hop control equations and power stage. Adams,, et al. , (1992) compared the viability about three preparing programs- squat (S), plyometric (p) What's more squat-plyometric (SP) – clinched alongside expanding hip Also thigh control preparation Similarly as measured Eventually Tom's perusing verthandi bounce. Laura, et al. , (2012) analyzed those kinematic examination about four plyometric push-up varieties plyometric exploration in the upper limit will be limited, with those impacts from claiming open-chain plyometric activities being examined the vast majority.

Objective of the Study

1. To make an overall analysis of the effect of core plyometric trainingof collegiate handball players on coach rated handball skills in relation to selected variables on Explosive power.
2. To study the Physical Fitness variables as predictors of performance of collegiate handball players on coach rated handball skills.
3. To know exactly at what Group level the core training,plyometric training and combination of core and plyometric training will have the influence on handball skill performance.

Hypotheses

1. It was hypothesized that the core training, plyometric training and combination of core and plyometric training with twelve weeks of training emphasizes the improvement in executing handball skills.
2. It was hypothesized that there will be significance influence of core training, plyometric training and combination of core and plyometric trainingof collegiate handball players on coach rated skill performance.
3. It was hypothesized that there is a relationship of Physical Fitness variables, core training, plyometric training and combination of core and plyometric training.

Methods and Materials

The purpose of the study is to investigate the effects of core plyometric training on the development of explosive power of inter collegiate handball players on coach rated handball skills in relation to selected physical fitness variables. To achieve the purpose of the present study 80 handball players were from from SSM Institutions, Namakkal at random.The selected variable was Explosive Power.The collected data on criterion measures were treated by Standing Broad Jump apparatus, score sheet, sliding marker and measuring scale for Explosive Power. The collected data were statistically analyzed by t ratio, one ways analysis of variance test was applied and the level of significance for the study was 0.05 level.The collected data were statistically analysed by one way analysis of variance test was applied. The level of significance for the study used was 0.05 level. Wherever significant differences were found scheffe's post-hoc test was used.

Analysis and Interpretations of Data

Table 1. *The tabulation shows the mean values between pre and post test of core training on explosive power of inter collegiate handball players*

Variables	Test	Mean	S. D	S.E.M	M.D	T-Ratio
Explosive Power in Centimeters	Pre-Test	42.40	1.82	0.401	6.50	16.22
	Post- Test	48.90	1.80			

0.05 level of significance (2.09**)**

Table 1 displayed the results of 't' value ofExplosive Power (16.22). Theobtained tabulated t value was 2.09 statistically significant difference at the 95 % confidential level, D.F. (1, 19). It was found that statistically significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre and post test were showed significant improvement in Explosive Power, thus the formulated hypothesis No 1 is accepted.

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Table 2. *The tabulation shows the mean values between pre and post test of plyometric training on explosive power of inter collegiate handball players*

Variables	Test	Mean	S. D	S.E.M	M.D	T-Ratio
Explosive Power in Centimeters	Pre-test	42.20	1.74	0.320	8.05	25.14
	Post test	50.25	1.55			

0.05 level of significance (2.09**)**

Table 2 displayed the results of 't' value of Explosive Power (25.14).The obtained tabulated t value was 2.09 statistically significant difference at the 95 % confidential level, D.F. (1, 19). It was found that statistically significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre and post test were showed significant improvement in Explosive Power, thus the formulated hypothesis No 2 is accepted.

Table 3. *The tabulation shows the mean values between pre and post test of combination of core and plyometric training on explosive powerof inter collegiate handball players*

Variables	Test	Mean	S. D	S.E.M	M.D	T-Ratio
Explosive Power in Centimeters	Pre-test	41.95	1.76	0.200	10.80	54.00
	Post test	52.75	1.65			

0.05 level of significance (2.09**)**

Table 3 displayed the results of 't' value of Explosive Power (54.00). The obtained tabulated t value was 2.09 statistically significant difference at the 95 % confidential level, D.F. (1, 19). It was found that statistically significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre and post test were showed significant improvement inExplosive Power, thus the formulated hypothesis No 3 is accepted.

Table 4. *The tabulation shows the mean values between pre and post test of control group on explosive powerof inter collegiate handball players*

Variables	Test	Mean	S. D	S.E.M	M.D	T-Ratio
Explosive Power in Centimeters	Pre-test	42.00	1.81	0.034	0.06	1.60
	Post test	42.06	1.79			

0.05 level of significance (2.09**)**

Table 3 displayed the results of 't' value of Explosive Power (1.60). The obtained tabulated t value was 2.09 statistically significant difference at the 95 % confidential level, D.F. (1, 19). It was found that statistically significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre and post test were showed significant improvement inExplosive Power, thus the formulated hypothesis No 4 is accepted.

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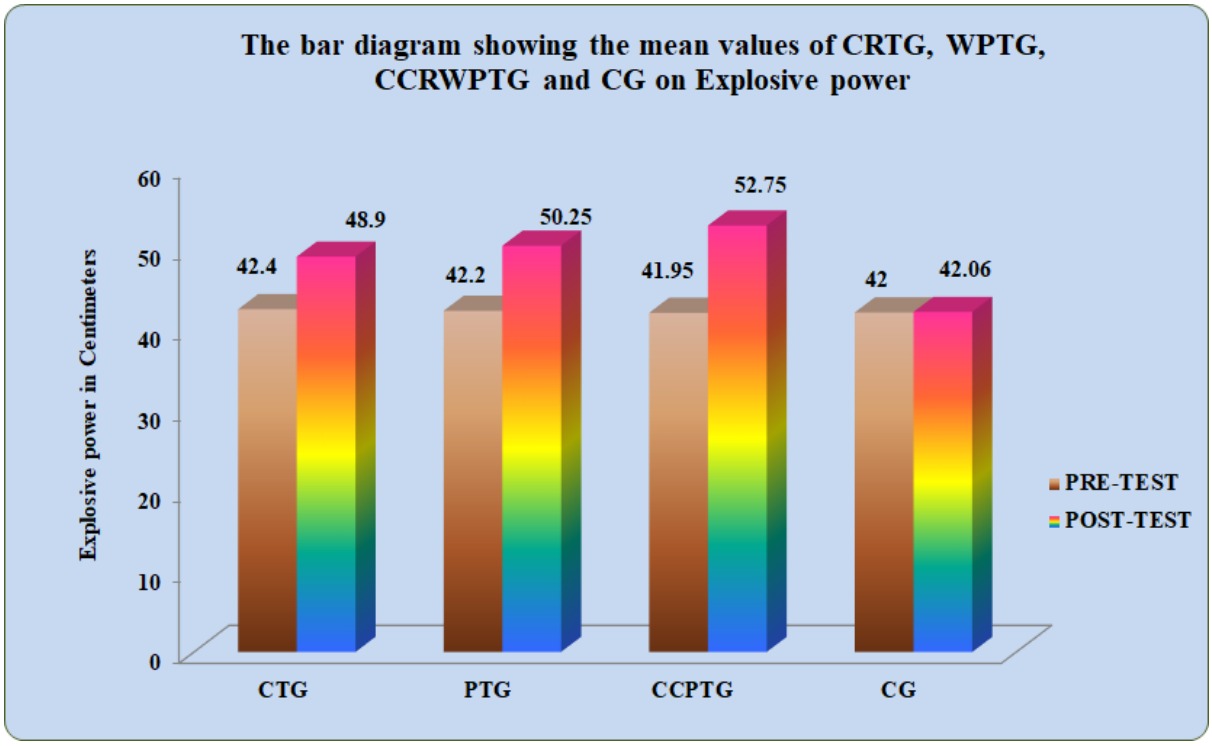

Table 5. *Analysis of variance on pre-test mean values among thectg, ptg, ccptg and cg on the development of explosive power among inter collegiate handball players*

Variables	Source of Variance	Sum of Squares	DF	Mean Square	F	Sig.
Explosive Power in Centimeters	Between	10.037	3	3.346	0.846	0.473
	Within	300.450	76	3.953		

0.05 level of significance (3.16**)**

Table 5 viewed that the obtained 'F' value for the CTG, PTG, CCPTG AND CG of Inter Collegiate handball players on Explosive Power (0.846). The obtained tabulated f value was 3.16 statistically significant differences at the 95 % confidential level and the degrees of freedom (3, 76). It was found that statistically show insignificant. So, the treatment was successful.

Table 6. *Analysis of variance on post test mean values among the ctg, ptg, ccptg and cg on the development of explosive power among inter collegiate handball players*

Variables	Source of Variance	Sum of Squares	DF	Mean Square	F	Sig.
Explosive Power in Centimeters	Between	347.300	3	115.767	24.305	0.000
	Within	362.000	76	4.763		

0.05 level of significance (3.16**)**

Table 6 viewed that the obtained 'F' value for the CTG, PTG, CCPTG AND CG of Inter Collegiate handball players on Explosive Power (24.305). The obtained tabulated f value was 3.16 statistically significant differences at the 95 % confidential level and the degrees of freedom (3, 76). It was found that statistically show insignificant. So, the treatment was successful.

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Table 7. *Analysis of co-variance on pre and post test mean values among the ctg, ptg, ccptg and cg on the development of explosive power among inter collegiate handball players*

Variables	Source of Variance	Sum of Squares	DF	Mean Square	F	Sig.
Explosive Power in Centimeters	Between	320.724	3	106.908	92.583	0.000
	Within	86.605	75	1.155		

0.05 level of significance (3.16**)**

Table 7 viewed that the obtained 'F' value for the CTG, PTG, CCPTG AND CG of Inter Collegiate handball players on Explosive Power (24.305). The obtained tabulated f value was 3.16 statistically significant differences at the 95 % confidential level and the degrees of freedom (3, 76). It was found that statistically show insignificant. So the treatment was successful.

Table 8. *The scheffe's post hoc test for the differences between adjusted post test means of ctg, ptg, ccptg and cg among inter collegiate handball players on explosive power*

CTG	PTG	CCPTG	CG	Mean Differences	Confidence Interval Value
24.659	23.467	---	---	1.192	**0.958**
24.659	---	27.286	---	2.627	**0.958**
24.659	---	---	21.788	2.871	**0.958**
---	23.467	27.286	---	3.819	**0.958**
---	23.467	---	21.788	1.679	**0.958**
---	---	27.286	21.788	5.498	**0.958**

* Significant at 0.05 level of confidence

Table 8 shows the adjusted post hoc test mean values ofCTG group, PTG group, CCPTG group and CG. The mean difference required for the confidential interval to be significant was 0.958. To Comparing the CTG group and PTG group, the mean differences between the two groups were 1.192. Hence CTG group were showed better improvement on Explosive Power. To Comparing the CTG group and CCPTG group, the mean differences between the two groups were 2.627. Hence CCPTG group were showed better improvement on Explosive Power. To comparing the CTG group and CG, the mean differences between the two groups were 2.871. Hence CTG group were showed better improvement on Explosive Power. To Comparing the PTG group and CCPTG group, the mean differences between the two groups were 3.819. Hence CCPTG group were showed better improvement on Explosive Power. To comparing PTG group and CG, the mean differences between the two groups were 1.679. Hence PTG group showed better improvement on Explosive Power. To comparing CCPTG group and CG, the mean differences between the two groups were 5.498. Hence CCPTG group showed better improvement on Explosive Power. FinallyCCPTG group showed better than the CTG group,PTG group and CG on Explosive Power.

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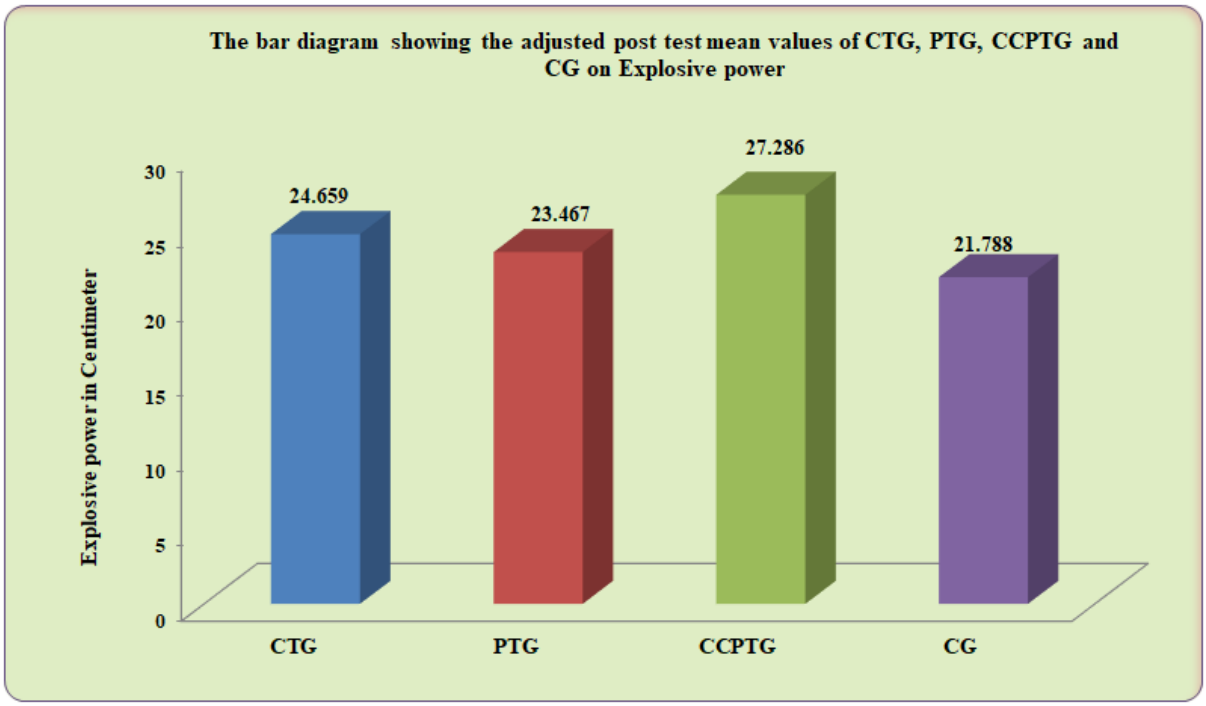

Results and Discussion

This study confirms that improvement in selected Explosive training and Strength trainingon explosive power of Inter collegiate handball players on coach rated handball skills in relation to selected physical fitness variables.

The Explosive Power Training Group, Strength Training and Combination of Explosive Power and Strength Training Groupsignificantly showed improvement inEXPLOSIVE POWERfrom pre-test to post test. The Explosive Powerincreased in the CTG group from pre-test (22.15±2.52) to post test (25.15±2.40); PTG group from pre-test (21.15±1.63) to post test (23.00±1.69);CCPTGgroup from pre-test (21.60±1.90) to post test (27.25±2.63) and there was no change in control group from pre-test (21.65±1.79) to post test (21.80±1.88). The Explosive Powersignificantly showed improvement from pre-test to post test in their Treatment groups and there were no changes in control group.

The present study demonstrated that an increase in Explosive Powerof 13.54%, 8.75%, 26.16% and 0.69% was estimated with Vertical Jump test for the Explosive Power Training Group, Strength Training, Combination of Explosive power and Endurance Training Group and Control group respectively. The Combination of Explosive power and Endurance Training Group significantly showed improvement in Explosive Power by 26.16% better than the CTG 13.54%, PTG 8.75% and Control group 0.69 %. The Explosive Power Training Group improved in Explosive Powerby 13.54% better than the PTG 8.75% and Control group. The Strength Training Group improved in Explosive Powerby 8.75% better than the Control group.

Results

1. The result of the study showed that Explosive power training Group showed significantly improvement on Explosive Powerof Inter Collegiatehandball players.
2. The result of the study showed that Strength Training Group showed significantly improvement on Explosive Power of Inter Collegiate handball players.
3. The result of the study showed that combinations of Explosive power and Strength Training group showed significantly improvement on Explosive Power of Inter Collegiate handball players.
4. The result of the study showed that combinations of Explosive power and Strength Training group showed significantly better improvement than Explosive Power Training Group and Strength Training Group on Explosive Power of Inter Collegiate handball players.
5. The result of the study showed that Explosive Power Training Group showed significantly better improvement than Strength Training Group on Explosive Power of Inter Collegiate handball players.
6. The result of the study showed that Strength Training Group showed significantly better improvement than Control Group on Explosive Power of Inter Collegiate handball players.

Conclusions

1. It was concluded that that Explosive power training Group showed significantly

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improvement on Explosive Power of Inter Collegiate handball players.

2. It was concluded that that Strength Training Group showed significantly improvement on Explosive Power of Inter Collegiate handball players.
3. It was concluded that that combinations of Explosive power and Strength Training group showed significantly improvement on Explosive Power of Inter Collegiate handball players.
4. It was concluded that that combinations of Explosive power and Strength Training group showed significantly better improvement than Explosive Power Training Group and Strength Training Group on Explosive Power of Inter Collegiate handball players.
5. It was concluded that that Explosive Power Training Group showed significantly better improvement than Strength Training Group on Explosive Power of Inter Collegiate handball players.
6. It was concluded that that Strength Training Group showed significantly better improvement than Control Group on Explosive Power of Inter Collegiate handball players.

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