SCIENTIFIC ANALYSIS ON THE EFFECTS OF INTENSITY TRAINING, PROGRESSIVE RESISTANCE TRAINING AND COMBINATION OF INTENSITY TRAINING WITH PROGRESSIVE RESISTANCE TRAINING ON AGILITY

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Abstract
To achieve this purpose sixty male students (N=60) who were studying intermediate course were selected randomly as subjects from SSBN Junior College, Ananthapuramu, Andhra Pradesh, India. Their age is between 16 and 18 years. The selected subjects were randomly divided into four groups i.e. three experimental groups and a control group contained 15 each. The three experimental groups are combination of intensity training with progressive resistance training (CIPRTG), progressive resistance training group (PRTG) and intensity training group (ITG). Group–I (CIPRTG) underwent combination of intensity training with progressive resistance training, Group–II (PRTG) underwent progressive resistance training, Group–III (ITG) underwent Intensity training, and Group–IV (CG) acted as control group, which did not receive any training. The data collected from the four groups prior to and after the experimental period on agility were statically analyzed for significant difference if any by employing analysis of covariance (ANCOVA). All the data were analyzed by using SPSS package. The level of confidence was fixed at 0.05 for significance as the number of subjects was limited and because the selected variables might fluctuate due to various extraneous factors as mentioned in the limitations. In addition to this, Scheffe's post-hoc test was employed, when the 'F' ratio of adjusted post test means was significant to find out the paired mean difference, if any, among the groups of each variable separately. The effect of combination of intensity training with progressive resistance training (CITPRTG), progressive resistance training (PRTG), intensity training (ITG) and control groups on agility is presented in Table 1. The analysis of covariance proved that the intensity training group when compared with combination of intensity training with progressive resistance training group, progressive resistance training group and control group.

Introduction
Human lifespan undergoes a series of developmental periods and changes right from conception to death. Each period has its own characteristic strategies that show a rational impact on physical, physiological, psychological, emotional and nutritional status of an individual irrespective of age and gender. Natural ability is the promise of potential but fundamentals are the foundation of excellence **(H. Clark 1987).**

The physical fitness programs and regular exercises is the solution for the present day man's physical and mental problems. Mental wellness is generally viewed as a positive attribute such that a person can reach enhanced levels of mental health. Regular exercises can result in additional psychological benefits apart from the physical benefits like reduction in mental tension improved sense of well-being, self concept, ability to enjoy leisure, assertiveness and self control **(James. G. 1999).**

Agility often represented by the terms "maneuverability", "mobility", and "shiftiness". It is the ability to change direction of the body and its parts rapidly. Agility is combination of several athletic traits, including strength, reaction time, speed of movement, power, and coordination. Agility either, general or specific can be improved by increasing the athletic components which constitute it. Coordination involved in the specific movements is by far the most important component of agility. If a person is poorly coordinated (awkward), he will lack agility regardless of the other traits he possesses.

Therefore, great emphasis should be placed on developing coordination in the movement patterns essential to the given performance. Improvement of the other components of agility offer limited, but worth-while, opportunities. Therefore, only the application of the components to agility is discussed here.

Methods

To achieve this purpose sixty male students (N=60) who were studying intermediate course were selected randomly as subjects from SSBN Junior College, Ananthapuramu, Andhra Pradesh, India. Their age is between 16 and 18 years. The selected subjects were randomly divided into four groups i.e. three experimental groups and a control group contained 15 each. The three experimental groups are combination of intensity training with progressive resistance training (CIPRTG), progressive resistance training group (PRTG) and intensity training group (ITG). Group–I (CIPRTG) underwent combination of intensity training with progressive resistance training, Group–II (PRTG) underwent progressive resistance training, Group–III (ITG) underwent Intensity training, and Group–IV (CG) acted as control group, which did not receive any training. The data collected from the four groups prior to and after the experimental period on selected physical and physiological variables were statically analyzed for significant difference if any by employing analysis of covariance (ANCOVA). All the data were analyzed by using SPSS package. The level of confidence was fixed at 0.05 for significance as the number of subjects was limited and also because the selected variables might fluctuate due to various extraneous factors as mentioned in the limitations. In addition to this, Scheffe's post-hoc test was employed, when the 'F' ratio of adjusted post test means was significant to find out the paired mean difference, if any, among the groups of each variable separately.

Results

The analysis of covariance on the date obtained for agility of pre test, post test and adjusted post test of combination of intensity training with progressive resistance training, progressive resistance training and intensity training and control groups are presented in table 1.

Table 1
Analysis of Covariance for the Pre Test, Post Test and Adjusted Post Test Data   on   Agility of Combination of Intensity Training with Progressive Resistance Training, Progressive Resistance Training, Intensity Training and Control Groups

Tests / Groups		CITPRTG	PRTG	ITG	Control Group	SOV	Sum of Squares	df	Mean Squares	F ratio
Pre Test	$\bar{X}$	12.12	12.43	12.20	12.68	B	2.88	3	.961	2.388
	σ	.353	.602	.549	.584	W	15.88	56	.284	
Post Test	$\bar{X}$	11.43	11.44	11.48	12.66	B	18.90	3	6.32	34.78*
	σ	.250	.340	.433	.593	W	10.17	56	.182	
Adjusted Post Test	$\bar{X}$	11.32	11.34	11.4	12.65	B	12.68	3	4.22	32.33*
						W	7.19	55	.131	

*Significant at 0.05 level of confidence.
 SOV: Source of Variance; B: Between, W: Within
(The Table value for significance at 0.05 level with df 3 and 56 is 2.769 and 3 and 55 is 2.773 respectively)

The statistical analysis from the table 1 show that the pre test means on agility of combination of intensity training with progressive resistance training (CITPRTG), progressive resistance training (PRTG), intensity training (ITG) and control groups are 12.12, 12.43, 12.20 and 12.68 respectively. The obtained F ratio 2.388 for pre test is lesser than the table value of 2.769. Hence, the pre test was not significant at 0.05 level of confidence for the degrees of freedom of 3 and 56 on agility.

The post test means of combination of intensity training with progressive resistance training, progressive resistance training and intensity training and control groups are 11.43, 11.44, 11.48 and 12.66 respectively. The obtained F ratio 34.78 for post test is greater than the table value of 2.769. Hence, the post test was significant at 0.05 level of confidence for the degrees of freedom 3 and 56.

The adjusted post test means on agility of combination of intensity training with progressive resistance training, progressive resistance training and intensity training and control groups are 11.32, 11.34, 11.4 and 12.65 respectively. The F ratio obtained for adjusted post test 32.33 is also greater than the table value of 2.773. Hence, the adjusted post test was significant at 0.05 level of confidence for the degrees of freedom 3 and 55.

The study indicates that the significant difference exist among the adjusted post test means of four groups, i.e. three training groups and a control group, Further, to determine the significant difference among the four paired means, the Scheffe's test was applied as post hoc test and the results are presented in table IA.

Table 1A
Scheffe's Post hoc Analysis for the differences between the Adjusted Post Test Paired Means on Agility of Three Training Groups and Control Group

| Adjusted Post Test Means				Mean Difference	Required CI
CITPRTG (I)	PRTG (II)	ITG (III)	CG (IV)		
11.32	11.34			0.02	
11.32		11.4		0.08	
11.32			12.65	1.33*	
	11.34	11.4		0.26	**0.3801***
	11.34		12.65	1.31*	
		11.4	12.65	1.05*	

*Significant at 0.05 level

Table 1A shows that the adjusted post test mean difference on agility of combination of intensity training with progressive resistance training (I), progressive resistance training (II), intensity training (III) and control group (IV) are 0.02, 0.08, 1.33, 0.26, 1.31 and 1.05 respectively.

The mean difference between CITPRTG and CG is 1.33, PRTG and CG is 1.31, and ITG and CG is 1.05, which are higher than the confidence interval value of 0.3801 on agility at 0.05 level of confidence. Hence, the significance exists between groups I and IV, II and IV, and III and IV.

Further, the difference between CITPRTG and PRTG is 0.02, CITPRTG and ITG is 0.08, and PRTG and ITG is 0.26, which are lesser than the confidence interval value of 0.3801 on agility at 0.05 level of confidence. Hence, the insignificance exists between groups I and II, I and III, and II and III.

The pre test, post test and adjusted post test mean values of combination of intensity training with progressive resistance training, progressive resistance training and intensity training and control groups on agility are graphically presented in figure 1.
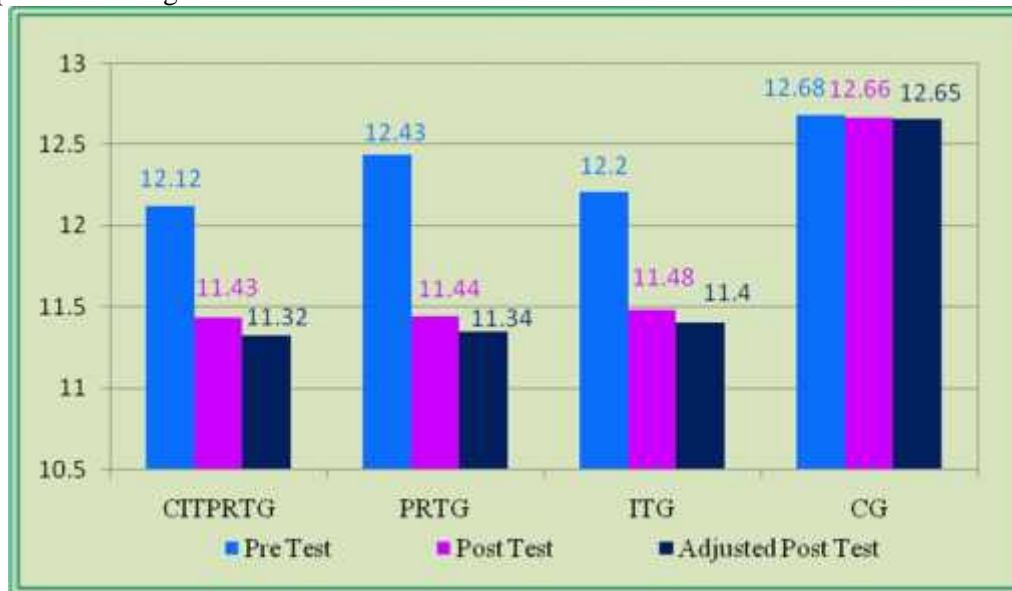
Figure 1: Bar Diagram Showing Pre Test, Post Test and Adjusted Post Test Means of Combination of Intensity Training with Progressive Resistance Training, Progressive Resistance Training, Intensity Training and Control Groups on Agility

Conclusions
1. Agility highly focused on intensity training group when compared with combination of intensity training with progressive resistance training group, progressive resistance training group and control group.
2. It was, concluded that agility favoured to combination of intensity training with progressive resistance training group when compared with progressive resistance training and control group.
3. It was, concluded that agility preferred to progressive resistance training group when compared with control group.

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