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Effect of strength and psychological training on archery performance among young archery players

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Abstract

The objective of the study was to determine the effect of Strength and Psychological training on Archery Performance of male Archers. Sixty male Archers of District Level Sports School of Gujarat were selected as subject for this study. The age of the subjects were range from 14-18 years. The study was further confined to eight weeks of strength training and psychological training program only. There were 60 subjects in three groups, which were consisting of one control group (CG, n=20) and two experimental group (psychological cum strength group (PCSG), n=20 and Strength group (PG), n=20), Archery performance was tested by AAPHER Archery Test, respectively twice i.e. before and after the particular eight weeks training. Analysis of co-variance (ANCOVA) was applied at 0.05 level of significance to test the hypothesis. The result reveals that there was significant ($p < .05$) effect of strength and psychological training on Archery performance of Archery players.

Keywords: Strength training and psychological training, archery performance, AAPHER archery performance test

1. Introduction

Archery is the sport, practice, or skill of using a bow to shoot arrows at a target. It is one of the oldest activities in human history, originally used for hunting and warfare, dating back thousands of years. Today, archery is primarily a competitive sport and recreational activity. It requires a combination of focus, strength, coordination, and mental discipline. Archery offers numerous benefits, including improved concentration, hand-eye coordination and strength. The Archery is a sport that demands a high level of fitness due to its long hours of training and competitive nature. The performance of archers is reliant on varied factors. These factors range from biomechanical, physical, physiological to psychological. The beneficial effect of yoga on physical, physiological and psychological functioning has been advocated in so many scientific studies. Archery performance refers to the ability of an archer to consistency shoot arrows accurately and effectively at a target. It involves a combination of technical skill, physical strength, mental focus, and proper equipment management.

Strength training is any form of resistance training engaged in to enhance muscle strength. (Jones, G. 2009)

Psychological training refers to the systematic practice of mental skills and strategies to improve focus, confidence, emotional control, and overall mental well-being.

2. Objective of research

The objective of the research was to determine the effect of strength and psychological training on Archery Performance of male Archers.

Criterion Measures

Hypothesis for selected measuring standards given below:

No.	Test	Measuring Standards
1	Archery performance	AAPHER Archery Performance Test

3. Methods

Sixty male Archers of District Level Sports School of Gujarat were selected as subject for this research. The age of the subjects were range from 14-18 years. The subjects were divided into three equal groups that were two experimental group (Strength training group and Strength cum psychological group) and one control group. Archery performance was tested by AAPHER Archery Performance Test respectively twice that were before and after the

particular eight weeks training.

3.1. Statistical Analysis

Analysis of Co-variance (ANCOVA) was applied at 0.05 level of significance.

4. Results of the study

The result of the study is presented in the following tables:

Table 1: Analysis of Covariance (ANCOVA) of Pre-Test, Post-Test and Adjusted Post-Test Mean on AAPHER Archery Performance of Experimental Groups and Control Group

Test	Group			ANOVA, ANCOVA TABLE			
	A	B	C	SS	df	MSS	F
Pre-Test Mean	283.300	288.400	287.900	316.133	2	158.067	0.443
				20360.800	57	357.207	
Post-Test Mean	295.050	303.050	285.550	3070.000	2	1535.000	4.967*
				17614.850	57	309.032	
Adjusted Mean	297.742	301.496	284.412	3221.755	2	1610.878	25.760*
				3501.949	56	62.535	

Significant Level at 0.05 $F(2, 57) = 3.159$ & $(2, 56) = 3.161$, A= Strength training, B= Strength cum Psychological training, C= Control Group

Results of Archery Performance

Table 1 shows the analysis data on AAPHER Archery Performance Test. The pre-test means of AAPHER Archery Performance Test were 283.300 for Strength Training Group, 288.400 for Strength cum Psychological Training Group and 287.900 for Control group. The obtained "F" ratio of 0.443 was lesser than the table F-ratio 3.159. Hence the pre-test was not significant at 0.05 level for the degree of freedom 2 and 57.

The post-test mean of AAPHER Archery Performance Test were 295.050 for Strength Training Group, 303.050 for Strength cum Psychological Training Group and 285.550 for control group. The obtained "F" ratio of 4.967 was higher than the table F-ratio 3.159. Hence the post –test was significant at 0.05 level for the degree of freedom 2 and 57.

The adjusted post–test mean of AAPHER Archery Performance Test were 297.742 for Strength Training Group, 301.496 for Strength cum Psychological Training Group and 284.412 for control group. The obtained "F" ratio of 25.760 was higher than the table F-ratio 3.161. Hence the post –test was significant at 0.05 level for the degree of freedom 2 and 56.

Table 2: Ordered scheffe's Post Hoc Test mean Differences on AAPHER Archery Performance Test among three groups

Mean			MD	CD
A	B	C		
297.742	301.496		3.754	5.009
297.742		284.412	13.330*	
	301.496	284.412	17.084*	

Significance level at 0.05, A= Strength training, B= Strength cum Psychological training, C= Control Group

Table 2 shows the Scheffe's post –hoc test result. The ordered adjusted final mean difference for AAPHER Archery Performance Test of experimental groups Strength Training Group, Strength cum Psychological Training Group and control group were tested for significant at 0.05 levels against confidential interval value.

The mean difference between Strength Training group training and Control group 13.330, Strength cum Psychological Training group training and Control group was 17.084 respectively, and it was seen to be greater than the confidential interval value of 5.009. Hence the above

comparisons were significant. But, Strength Training group training and Strength cum Psychological Training group training mean difference 3.754 which was lesser than the confidential interval value of 5.009, which was not significant.

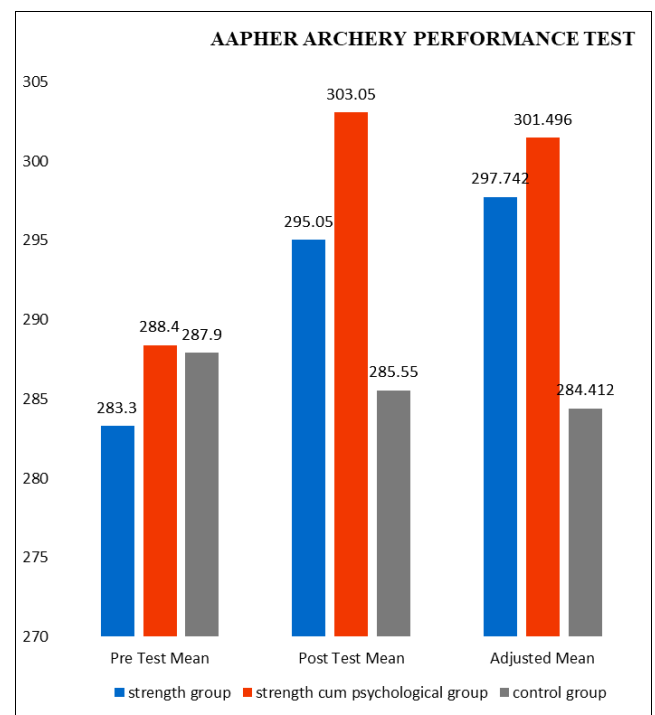


Fig 1: The Mean Value of AAPHER Archery Performance Test is Shown Graphically

Discussion of Finding

The data in Tables 1 and 2 provide valuable information about how various interventions, including strength training and strength-cum psychological training, affect AAPHER Archery Performance both before and after the intervention.

According to the pre-test mean statistics in Table 1, there were no statistically significant differences in the groups' mean AAPHER Archery Performance scores prior to the intervention. As a result, it can be said that the individuals were dispersed equally across all groups, guaranteeing that the groups were equivalent at the beginning of the

investigation.

Both experimental groups' mean scores on the static AAPHER Archery Performance test showed a substantial improvement following the intervention, according to statistics of the post-test mean and adjusted mean in Table 1. Prior studies like Yudho *et al.* (2022), Suppiah *et al.* (2017), Park and Kim (2020), Kai-bin *et al.* (2010), etc., discovered comparable outcomes. As a result, the search results validate the hypothesis that was developed at the start of the study, which states that "There will be positive significant difference on mean scores of static AAPHER Archery Performance Test of Strength training group and strength cum Psychological training group."

The LSD statistics in Table 2 highlight that, in comparison to the control group, the subjects' static AAPHER Archery Performance variable was more affected by the Strength training group (mean deviation of 13.330*) than by the Strength cum Psychological training group (17.084*).

5. Conclusion

Based on result it was concluded that practice of selected strength and psychological exercises helped to improve Archery performance of Archery players.

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