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## A comparative study of the effect of training given in different seasons on respiratory rate and breath holding time in archery athletes

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### Abstract

The aim of this study was to compare the effects of training in different climates on respiratory rate and breath-holding time in archery athletes. For this research, 60 male archery players in the age group of 13 to 20 years were selected as subjects from archery clubs under Amravati division. The selected subjects were divided into three groups. In this study, the subjects were divided into three equal groups. The first group was trained from July to September, the second group was trained from November to January and the third group was trained from April to June and they were called rainy season group, winter group and summer group. All the groups were given a 6-week training program. To measure the respiratory rate, the breathing cycles were measured in one minutes and the breath holding time was measured by stop watch. Descriptive statistics, paired sample t-test and covariance analysis (ANCOVA) were used to compare the effects of archery training program given in different seasons on selected factors. If the mean value was significant at the significance level, post hoc test was used to see the difference in the mean. It was concluded that there was a significant difference in breath holding time in the pre- and post-test of the experimental rainy season, winter season and summer season groups. But a significant difference was found in respiration rate only in rainy season and winter season. This made it clear that the training program of all three groups had a positive effect on breath holding time and a positive effect on respiration rate only in rainy season and winter season. By comparing the effects of the three groups, it was found that training in winter season is more beneficial than other seasons.

**Keywords:** Respiratory rate, breath holding time, archery

### Introduction

Training is the process of preparing a person for an event or an activity or a job. Usually in sports we use the word sports training which refers to the feeling of preparing the player for a high level of performance. But nowadays sports training is not just a word but a significant topic that affects every person who plays physical activities or sports for health or fitness or for different levels of competition. Therefore, sports training is the physical, technical, intellectual, mental and moral preparation of the player or athlete through physical exercise. Along with training, the seasons affect the sports performance of the players. Therefore, how much and how different seasons affect sports performance is the reason why the researcher felt the need to choose the problem.

Environment has a special importance in every person's life. Different seasons have an effect on the person's abilities. Similarly, different seasons have an effect on the sport of archery. Breathing is very important in the sport of archery. Seasonal changes have an effect on the sport of archery. Breathing affects archery performance. In archery, the archer must be stable so that he can perform effectively, he must have control over his bow, for which he must also have control over his breathing and breath control is very important to improve the overall performance of archers. Information about the physical condition of any person can be obtained through respiratory rate. As a basic test for studying the players and to know whether he is fit or not, his breathing can be tested to assess his physical condition. Heart function can also be assessed by testing the endurance of the respiratory muscles.

### Methodology

For this research, 60 male archery players in the age group of 13 to 20 years were selected as subjects from archery clubs under Amravati division. The selected subjects were divided into

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### Training program

The present study conducted a 6-week archery training program, which consisted of 5 minutes of walking, 10 minutes of jogging, 10 minutes of exercise, 10 minutes of stretching, 30 minutes of archery training, and 5 minutes of cooling down, for a total of 70 minutes of training.

### Statistical techniques

Descriptive statistics, paired sample t-test and covariance analysis (ANCOVA) were used to compare the effects of

archery training program given in different seasons on selected factors. If the mean value was significant at the significance level, post hoc test was used to see the difference in the mean.

**Table 1:** Shows paired sample t-test between pretest and posttest of respiration rate among groups

Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Rainy season	Pretest	17.00	2.10	0.63	1.05	5.29*	19	2.093
	Posttest	15.95	1.88					
Winter	Pretest	16.70	1.84	0.60	1.55	8.4*	19	2.093
	Posttest	15.15	1.95					
Summer	Pretest	16.95	2.09	0.65	0.05	0.15	19	2.093
	Posttest	17.00	2.05					

Table No.1: indicates the obtained 't' ratio (5.29) and (8.4) is more than the required table values of 2.093 for degrees of freedom 19. The result of the study was indicated that there was significant difference in respiration rate between pre and post test of rainy season and winter season group.

**Table 2:** Shows paired sample t-test between pretest and posttest of breath holding time among groups

Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Rainy season	Pretest	39.15	7.41	2.32	3.55	11.384*	19	2.093
	Posttest	42.70	7.26					
Winter	Pretest	40.20	8.28	2.80	5.55	11.344*	19	2.093
	Posttest	45.75	9.42					
Summer	Pretest	40.40	6.20	2.10	4.50	9.096*	19	2.093
	Posttest	44.90	7.06					

Table No.2: indicates the obtained 't' ratio (11.384), (11.344) and (9.096) is more than the required table values of 2.093 for degrees of freedom 19. The result of the study was indicated

that there was significant difference in breath holding time between pre and post test of rainy season, winter season and summer season group.

**Table 3:** Shows the comparison of respiration rate and breath holding time of rainy season, winter season and summer season group of pre and post test

Variables		Sum of squares	df	mean square	F	Sig.
RR	Contrast	27.988	2	13.994	12.033*	.000
	Error	65.127	56	1.163		
BHT	Contrast	37.735	2	18.868	4.988*	.010
	Error	211.825	56	3.783		

Table No.3: indicates the obtained 'F' ratio (12.033) and (4.988), is more than the required table values for degrees of freedom (2,56). The result of the study was indicated that

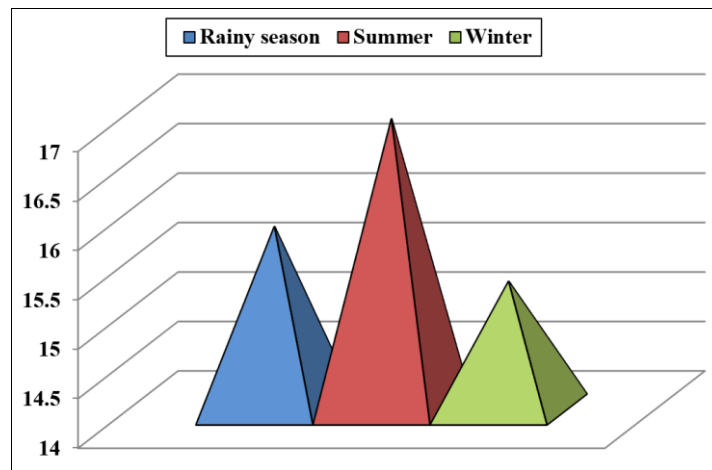
there was significant difference in respiration rate and breath holding time of rainy season, winter season and summer season group of pre and post test.

**Table 4:** Shows the pair wise comparisons of respiration rate of rainy season, winter season and summer season group of pre and post test adjusted means

Adjusted means			Mean difference	Sig. <sup>a</sup>
Rainy season	Summer	Winter		
15.855	16.946		1.091*	.002
15.855		15.300	0.555	.110
	16.946	15.300	1.646*	.000

Table No. 4: indicates the mean difference (1.091) and (1.646), is more than the required critical values. The result of the study was indicated that there was significant difference in

respiration rate of rainy season, winter season and summer season group of pre and post test adjusted Means.



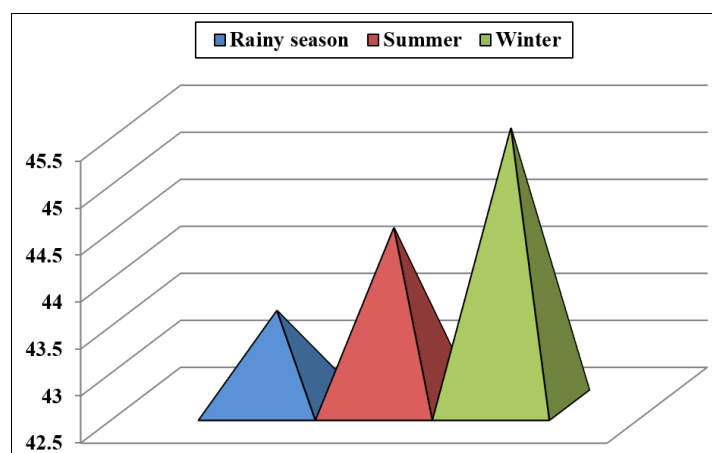
**Fig 1:** Shows the adjusted mean comparison of respiration rate of rainy season, winter season and summer season group of pre and post test

**Table 5:** Shows the pair wise comparisons of breath holding time of rainy season, winter season and summer season group of pre and post test adjusted means

Adjusted means			Mean difference	Sig. <sup>a</sup>
Rainy season	Summer	Winter		
43.508	44.390		0.882	.158
43.508		45.451	1.963*	.003
	44.390	45.451	1.061	.090

Table No.5: indicates the mean difference (1.963), is more than the required Critical values. The result of the study was indicated that there was significant difference in breath

holding time of rainy season, winter season and summer season group of pre and post test adjusted Means.



**Fig 2:** Shows the adjusted mean comparison of breath holding time of rainy season, winter season and summer season group of pre and post test

## Conclusion

It was concluded that there was a significant difference in breath holding time in the pre- and post-test of the experimental rainy season, winter season and summer season groups. But a significant difference was found in respiration rate only in rainy season and winter season. This made it clear that the training program of all three groups had a positive effect on breath holding time and a positive effect on respiration rate only in rainy season and winter season. By comparing the effects of the three groups, it was found that training in winter season is more beneficial than other seasons.

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