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Effect of Parachute Training on Heart Rate and Blood Pressure Among Physical Education Students

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ABSTRACT

This research aimed to investigate the impact of parachute training on heart rate and blood pressure among a group of 30 students from the Department of Physical Education at Annamalai University, Tamil Nadu, aged between 18 and 24 years. The participants were divided into two groups: the parachute training group (Group I) and the control group (Group II), each comprising fifteen subjects. Group I underwent a twelve-week training program, three days a week, while Group II served as a control with no specific training regimen beyond their regular physical education classes. Pre- and post-training assessments of resting heart rate, systolic and diastolic blood pressure were conducted using the radial pulse method and sphygmomanometer. Analysis of covariance (ANCOVA) was employed to determine significant differences between the groups, with a significance level of 0.05. The findings indicated that twelve weeks of parachute training, three days per week, resulted in a significant enhancement in both resting heart rate, systolic and diastolic blood pressure among the physical education students compared to the control group.

Keywords: Parachute training, Resting Heart Rate, Systolic and Diastolic Blood Pressure, Radial Pulse, Sphygmomanometer.

INTRODUCTION

Parachute running training is a unique and innovative exercise approach that integrates the use of a parachute to enhance an athlete's speed, strength, and overall performance. This form of training involves the individual wearing a specially designed parachute while engaging in running drills. The resistance created by the parachute adds an additional challenge, requiring the athlete to exert greater force and effort during their running strides.

The concept behind parachute running training is rooted in the principle of resistance training, where the added drag from the parachute intensifies the workout, leading to potential improvements in muscular strength, power and cardiovascular fitness. Athletes engaging in this type of training aim to optimize their sprinting capabilities, agility and explosiveness.

As a method increasingly adopted in various sports and fitness regimens, parachute running training has gained attention for its potential to elicit positive physiological adaptations. This introduction sets the stage

for exploring the effects and outcomes associated with parachute running training in diverse athletic and fitness contexts.

This research endeavours to contribute valuable insights into the efficacy of parachute running as a training modality, shedding light on its potential to improve cardiovascular health. The findings may not only inform the field of physical education but also guide individuals seeking diverse and effective approaches to enhance their overall fitness and well-being. Through a meticulous examination of the physiological responses to parachute running training, this study aims to provide a foundation for informed decision-making regarding the incorporation of this innovative training method into fitness regimens.

METHODOLOGY

The study involved 30 students from the Department of Physical Education at Annamalai University, Tamil Nadu, aged between 18 and 24 years. Participants were divided into two groups: the parachute training group (Group I) and the control group (Group II), each consisting of fifteen subjects. Parachute Training Group (Group I) underwent a twelve-week parachute training program, engaging in sessions three days a week. This training involved the use of a specially designed parachute during running drills, focusing on improving speed, strength, cardiovascular and overall athletic performance. Control Group (Group II) participants followed their regular physical education classes without any specific training regimen beyond the standard curriculum. Pre- and post-training assessments were conducted for resting heart rate, systolic blood pressure and diastolic blood pressure using the radial pulse method and a sphygmomanometer. Analysis of covariance (ANCOVA) was employed to determine significant differences between the groups. A significance level of 0.05 was set for all analyses.

ANALYSIS OF DATA

The data collected from the pre-test and post-test assessments of resting heart rate and blood pressure for both experimental and control groups were analysed by using analysis of covariance (ANCOVA). The results are presented below.

Resting Heart Rate

The analysis of covariance was performed on pre- and post-test scores of resting heart rate for both parachute training group and control group and the results are shown in table-I.

Table-I
ANALYSIS OF COVARIANCE FOR PRE AND POST-TEST SCORES OF RESTING HEART RATE FOR PARACHUTE TRAINING AND CONTROL GROUPS.

TEST	Parachute Training	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Pre test							
Mean	68.13	66.27	**Between**	26.13	1	26.13	1.09
S.D	5.42	4.33	**Within**	674.67	28	24.09	
Post test							
Mean	64.4	68.53	**Between**	128.13	1	128.13	9.41*
S.D	3.72	3.67	**Within**	381.33	28	13.62	

Adjusted Post test Mean	63.84	69.09	**Between** **Within**	199.32 138.13	1 27	199.32 5.12	38.96*

*Significant at 0.05 level of confidence.
(The table values required for significance at 0.05 level of confidence for 1 & 28 and 1 & 27 are 4.20 and 4.21 respectively).

Table-I displays the pre-test mean values for both the parachute training and control groups, which were 68.13 and 66.27, respectively. The calculated pre-test 'F' ratio of 1.09 suggests no significant difference in pre-test scores between the groups, as it is lower than the critical 'F' ratio of 4.20 with degrees of freedom (df) 1 and 28.

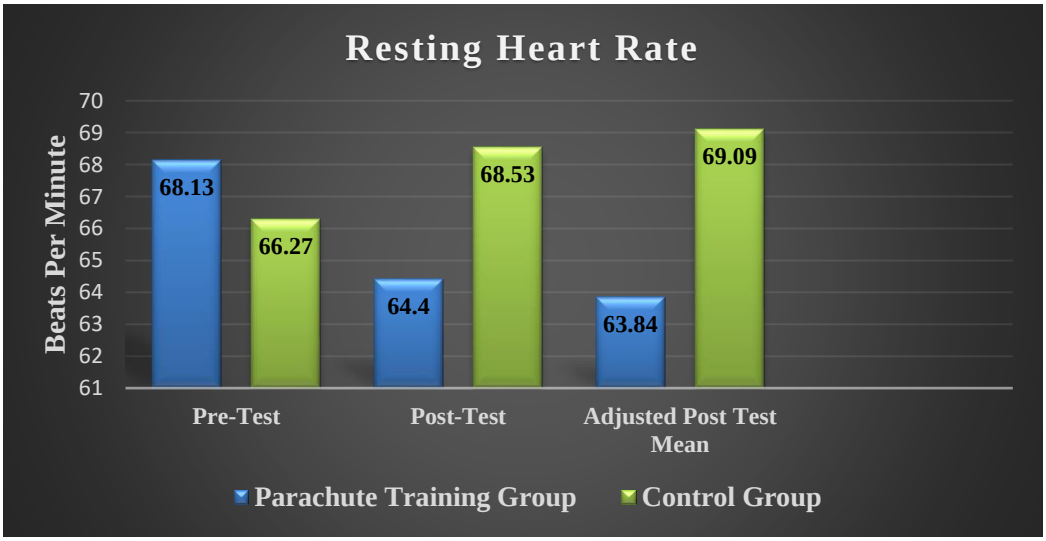
However, in the post-test, the mean values for the parachute training group and control group are 64.4 and 68.53 respectively, resulting in an 'F' ratio of 9.41. This value exceeds the table 'F' ratio of 4.20 (with df 1 and 28), indicating a significant difference in post-test scores between the two groups.

The adjusted post-test mean values for resting heart rate were 63.84 for the parachute training group and 69.09 for the control group, with an 'F' ratio of 38.96. This F ratio surpasses the table F ratio value of 4.21 (with df 1 and 27), confirming a significant difference in resting heart rate between the two groups.

In summary, the study's findings highlight a significant difference in resting heart rate between the parachute training group and the control group.

For a clearer interpretation of these results, Figure-I presents a bar chart illustrating the pre-test, post-test and adjusted post-test means.

Figure-I
BAR CHART ILLUSTRATING PRE TEST, POST TEST AND ADJUSTED POST MEAN VALUES ON RESTING HEART RATE



Systolic Blood Pressure

The analysis of covariance was performed on pre- and post-test scores of systolic blood pressure for both parachute training group and control group and the results are shown in table-II

Table-II

ANALYSIS OF COVARIANCE FOR PRE AND POST-TEST SCORES OF SYSTOLIC BLOOD PRESSURE FOR PARACHUTE TRAINING AND CONTROL GROUPS.

TEST	Parachute Training	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Pre test							
Mean	124.27	122.53	**Between**	22.53	1	22.53	0.72
S.D	6.96	3.74	**Within**	874.67	28	31.24	
Post test							
Mean	119.20	123.73	**Between**	154.13	1	154.13	10.65*
S.D	4.19	3.37	**Within**	405.33	28	14.48	
Adjusted Post test Mean	118.89	124.04	**Between**	194.24	1	194.24	17.89*
			Within	293.09	27	10.86	

*Significant at 0.05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 1 & 28 and 1 & 27 are 4.20 and 4.21 respectively).

Table-II displays the pre-test mean values for both the parachute training and control groups, which were 124.27 and 122.53, respectively. The calculated pre-test 'F' ratio of 0.72 suggests no significant difference in pre-test scores between the groups, as it is lower than the critical 'F' ratio of 4.20 with degrees of freedom (df) 1 and 28.

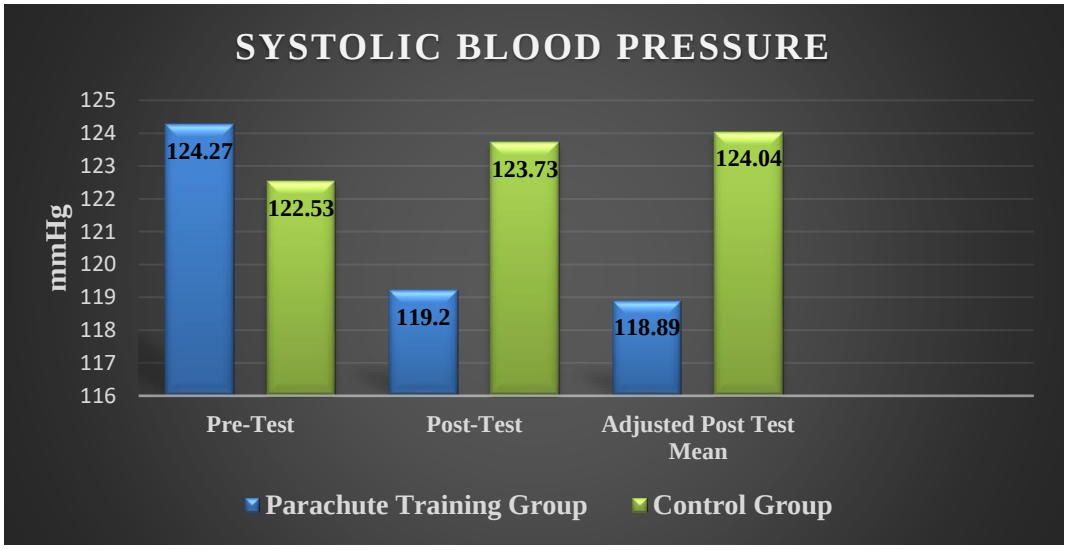
However, in the post-test, the mean values for the parachute training group and control group are 119.20 and 123.73 respectively, resulting in an 'F' ratio of 10.65. This value exceeds the table 'F' ratio of 4.20 (with df 1 and 28), indicating a significant difference in post-test scores between the two groups.

The adjusted post-test mean values for systolic blood pressure were 118.89 for the parachute training group and 124.04 for the control group, with an 'F' ratio of 17.89. This F ratio surpasses the table F ratio value of 4.21 (with df 1 and 27), confirming a significant difference in systolic blood pressure between the two groups.

In summary, the study's findings highlight a significant difference in systolic blood pressure between the parachute training group and the control group.

For a clearer interpretation of these results, Figure-II presents a bar chart illustrating the pre-test, post-test and adjusted post-test means.

Figure-II
BAR CHART ILLUSTRATING PRE TEST, POST TEST AND ADJUSTED POST MEAN VALUES ON SYSTOLIC BLOOD PRESSURE



Diastolic Blood Pressure

The analysis of covariance was performed on pre- and post-test scores of diastolic blood pressure for both parachute training group and control group and the results are shown in table-III

Table-III
ANALYSIS OF COVARIANCE FOR PRE AND POST-TEST SCORES OF DIASTOLIC BLOOD PRESSURE FOR PARACHUTE TRAINING AND CONTROL GROUPS.

TEST	Parachute Training	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Pre test							
Mean	85.07	83.73	**Between**	13.33	1	13.33	1.17
S.D	3.84	2.81	**Within**	317.87	28	11.35	
Post test							
Mean	80.93	84.40	**Between**	90.13	1	90.13	14.29*
S.D	2.37	2.64	**Within**	176.53	28	6.31	
Adjusted Post test Mean	80.71	84.62	**Between**	110.28	1	110.28	21.16*
			Within	140.74	27	5.213	

*Significant at 0.05 level of confidence.
(The table values required for significance at 0.05 level of confidence for 1 & 28 and 1 & 27 are 4.20 and 4.21 respectively).

Table-III displays the pre-test mean values for both the parachute training and control groups, which were 85.07 and 83.73, respectively. The calculated pre-test 'F' ratio of 1.17 suggests no significant difference in

pre-test scores between the groups, as it is lower than the critical 'F' ratio of 4.20 with degrees of freedom (df) 1 and 28.

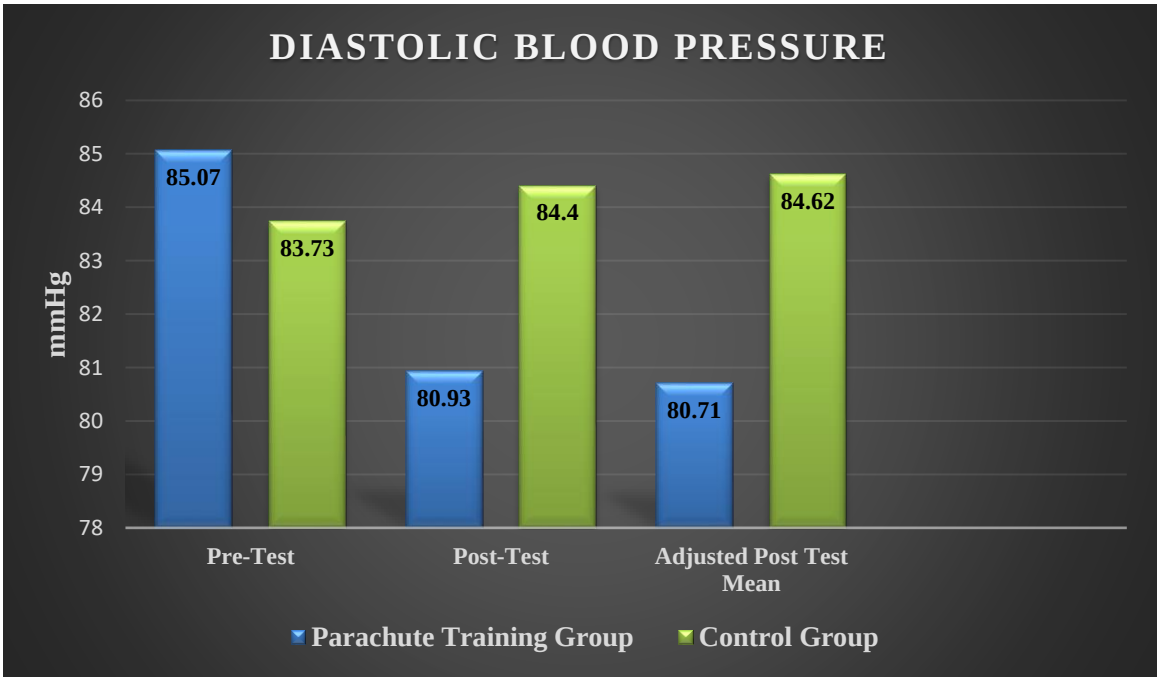
However, in the post-test, the mean values for the parachute training group and control group are 80.93 and 84.40 respectively, resulting in an 'F' ratio of 14.29. This value exceeds the table 'F' ratio of 4.20 (with df 1 and 28), indicating a significant difference in post-test scores between the two groups.

The adjusted post-test mean values for diastolic blood pressure were 80.71 for the parachute training group and 84.62 for the control group, with an 'F' ratio of 21.16. This F ratio surpasses the table F ratio value of 4.21 (with df 1 and 27), confirming a significant difference in diastolic blood pressure between the two groups.

In summary, the study's findings highlight a significant difference in diastolic blood pressure between the parachute training group and the control group.

For a clearer interpretation of these results, Figure-III presents a bar chart illustrating the pre-test, post-test and adjusted post-test means.

Figure-III
BAR CHART ILLUSTRATING PRE TEST, POST TEST AND ADJUSTED POST MEAN VALUES ON DIASTOLIC BLOOD PRESSURE



Discussion and Conclusions

The study aimed to investigate the effects of parachute training on heart rate and blood pressure among a group of students from the Department of Physical Education at Annamalai University, Tamil Nadu. The participants were divided into a parachute training group (Group I) and a control group (Group II). The

findings from the pre-test, post-test, and adjusted post-test assessments were analysed to determine the impact of the twelve-week parachute training program.

Resting Heart Rate:
The pre-test results showed no significant difference in resting heart rate between the parachute training and control groups. However, after the twelve-week training program, the post-test results revealed a significant decrease in resting heart rate in the parachute training group compared to the control group. The adjusted post-test values further confirmed this difference, indicating that parachute training led to a significant improvement in resting heart rate.

Systolic Blood Pressure:
Similar to resting heart rate, the pre-test results for systolic blood pressure did not indicate a significant difference between the two groups. In contrast, the post-test results showed a significant decrease in systolic blood pressure in the parachute training group compared to the control group. The adjusted post-test values reaffirmed this finding, suggesting that parachute training contributed to a significant improvement in systolic blood pressure.

Diastolic Blood Pressure:
The pre-test results for diastolic blood pressure also showed no significant difference between the groups. However, the post-test results demonstrated a significant decrease in diastolic blood pressure in the parachute training group compared to the control group. The adjusted post-test values supported this finding, indicating a significant improvement in diastolic blood pressure due to parachute training.

Similar studies have investigated the effects of resistance training on selected physical and physiological variables of male students by Kaukab Azeem et. al., (2019) found that resistance training is beneficial for improvement of physical as well as physiological variables. Additionally, a study by Koushik Bhowmik (2019) concluded that effect of specific training was also found that there is significant improvement in breath holding time and resting heart rate due to the treatment of specific training.

The study's findings strongly support the hypothesis that twelve weeks of parachute training, conducted three days a week, can lead to significant improvements in resting heart rate, systolic blood pressure, and diastolic blood pressure among physical education students. These outcomes underscore the potential of parachute training as an effective intervention for enhancing cardiovascular health and fitness.

In conclusion, the study provides substantial evidence that parachute training can positively impact cardiovascular parameters, including resting heart rate and blood pressure. The observed improvements suggest that incorporating parachute training into fitness regimens may offer a valuable and innovative approach to promoting cardiovascular health, especially among young adults engaged in physical education. These findings contribute valuable insights to the field of exercise science and may guide future research and practical applications of parachute training as a beneficial exercise modality.

REFERENCES

1. **Azeem K and Mohammed (2019).** The Effect of Resistance Training on the Selected Physical and Physiological Variables of the Male Students. International Journal of Pharmaceutical Research & Allied Sciences. 8(2)/198-205. 2277-3657.
2. **Bhowmik K (2018).** Effects of Specific Training on Selected physical and Physiological Variables among college Level Men Players. International Journal of Scientific Research in Science and Technology. 4(2)/1571-1579.
3. **Cronin, J. B., & Hansen, K. T. (2005).** Resisted sprint training for the acceleration phase of sprinting. Strength and Conditioning Journal, 27(2), 24-32.
4. **Makaruk B, Sozanski H, Makaruk H, Sacewicz T (2013).** The effects of resisted sprint training on speed performance in women. Human Movement. 14(2), 116-122
5. **Martinopoulou, Argeitaki et al., (2011).** The effects of resisted training using parachuteon sprint performance. Journal Biology of Exercise.7.1, 1791-325X.
6. **Sathyakumar R, Kumaresan P and Arumugam S (2018).** Influence of Speed Training on Speed and Vital Capacity among Sprinters. International Journal of Research and Analytical Reviews. 5(12)/1016-1019. 2349-5138.