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## Effect of mountaineering training on selected physiological variable among moderate altitude inhabitants

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### Abstract

Training is teaching, or developing in one's self or other, any skill and knowledge that related to specific use full competencies. Training has definite ambition of improving once potential, power, efficiency and performance. The reason of the study was to realize out the effect of mountaineering training on selected physiological variable (Blood Pressure) among moderate altitude inhabitants. For the purpose of the study fifty male students were selected as subject form the Jawahar Institute of mountaineering and winter sports Phalgam, Anantanag (J&K). The age of the students which serve as subject was ranged 18 - 26 years, which was confirmed from institute record. The subjects were divided into equal groups, Group A- Experimental (N =25) and Group- B as Control Group (N=25). All the selected subjects were informed about the aim and method of the study. The experimental group was given special training for twelve week. The control group was not given any training rather than their daily work routines. The obtained data from the experimental and control group before and after the experimental period were statistically analyzed with dependent "t"-test and analysis of covariance (ANCOVA). The level of significance was set at 0.05 levels. The result of the study showed that the 12 weeks training program had significant improvement on selected physiological variable (Blood Pressure) among moderate altitude inhabitants.

**Keywords:** Mountaineering, blood pressure, moderate inhabitants

### Introduction

Mountaineering as sports, is rock climbing simultaneously recreational and competitive. Rock has been used by humankind throughout history. The minerals and metals in rocks have been essential to human civilization: Coalter, *et al.*, 2010 [2]. They are recreational in the sense that most climbers climb for love of the sports, but competitive when climbers seek to climb first, highest, or by a new route. Mountaineering as a sport consists of Ascending and descending mountains under the climber's own power, at one end or other, the relatively gentle climb for which climbers need little equipment. The world's highest and most daunting peaks require months and years of preparation for climbing to the peaks Whitlock, *et al.*, 1991 [3]. In recent years, both men and women have adapted mountaineering and rock-climbing techniques to indoor-sports climbing on vertical surface. The sport of rock climbing evolved from this ancient tradition of climbing mountains. Climbing skills and techniques were developed by making mountaineering training programs through many institutions. When it comes to physical fitness required for climbing, strength and power are two vital factors for successful performance. Researchers have shown that success in climbing performance is best explained by trainable variables such as shoulder strength and endurance, forearm strength and endurance, and maximum grip strength, and also improves physiological parameters such as resting pulse rate, Breath holding time and blood pressure rather than anthropometric characteristics such as height and weight.

Mountaineering is the setof activities that involve ascending mountains; related activities include traditional outdoor climbing, hiking, skiing, and traversing via ferratas. Indoor climbing, sport climbing and bouldering are usually considered mountaineering as well. While mountaineering began as attempts to reach the highest point of unclimbed big mountains, it has branched into specializations that address different aspects of mountains, depending on

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whether the route chosen is over rock, snow or ice, or level ground. All require various degrees of experience, athletic ability, and technical knowledge to maintain safety. The beginning of mountaineering as a sport in the UK is generally dated to the ascent of the Wetterhorn in 1854 by English mountaineer Sir Alfred Wills, who made mountaineering fashionable in Britain. This inaugurated what became known as the Golden age of alpinism, with the first mountaineering club - the Alpine Club - being founded in 1857, Hansen 1995 [4].

**Physiological Variables**

Among the many physiological variables the selected variable such as blood pressure, play important role in sports performance. High level of performance of Moderate inhabitants might be dependent upon their physiological make up. It was recognized that physiological proficiency was needed for high level performance. For specific physiological systems of the body to be fit, they must function well enough to support the particular game the players are playing. Since different games make different demands upon the organism with respect to neurological, respiratory, circulatory and temperature functions, physiological fitness is specific to the activity. Physiological systems are highly adaptive to exercise. The response of each system is distinctive, for example, hard work in the heat is necessary to improve the fitness of the temperature regulation mechanism. Each task has its major physiological components and fitness for the task requires effective functioning of appropriate systems.

Blood pressure is related to the endurance of a player. The systolic blood pressure of a fit player will not fall as a result of exercise in comparison to that of a player who is unfit. It has been reported in research findings that trained individual can carry on heavy work for a longer duration without much change in individual blood pressure. Literature also reveals that as a result of training recovery of blood pressure is quicker.

**Materials and Methods**

The purpose of the present study was to investigate the effect of mountaineering training on selected physiological variable among Moderate altitude inhabitants. To full fill the aim of the study fifty male students of Jawahar Institute of mountaineering and winter sports Phalgam, Anantanag Kashmir (J&K) were selected which serves subjects. The fifty male students were divided in two equal groups named as Group - A, experimental group which is in number twenty five and other Group- B is named as control group which is also consists twenty five subjects. The simple random sampling was applied to select the subjects for the study. The age of the students was between 18 to 26 years.

**Result and discussion**

The analysis of covariance on the obtained scores in pre, post and adjusted post test of the control group, experimental groups (mountaineering training) for physiological variable namely systolic blood pressure have been presented in the table No.1.

**Table 1:** Analysis of covariance for the pre, post and adjusted post test mean values of mountaineering training on experimental group with control group on systolic blood pressure.

	Training Group	Control Group	SoV	SS	df	MS	"F" Ratio
Pre-test Mean	123.00	122.72	BG	0.98	1	0.98	0.52
SD (±)	1.60	1.06	WG	89.04	48	1.85	
Posttest Mean	119.68	122.80	BG	121.68	1	121.68	14.47*
SD (±)	3.96	1.04	WG	403.44	48	8.40	
Adjusted Posttest Mean	119.56	122.91	BG	138.35	1	138.35	18.80*
			WG	345.86	47	7.35	

\*Significant at 0.05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 1 &48 are 4.00 respectively)

The table - 1 show that the pre-test mean values on systolic blood pressure of mountaineering training group (MTG), and control group (CG) are 123.00, and 122.72 respectively. The obtained 'F' ratio 0.52 for pre-test scores was less than the table value 4.00 at df (1, 48) that indicates there is no significant difference on systolic blood pressure between groups. The post-test mean values on systolic blood pressure of mountaineering training group (MTG), and control group (CG) are 119.68 and 112.80 respectively. The obtained 'F' ratio 14.47 for post-test scores was greater than the table value 4.00 for df 1 and 48 required for significance at 0.05 level of confidence on systolic blood pressure. The adjusted

post-test means of mountaineering training group (MTG) and control group (CG) are 119.56 and 122.91 respectively. The obtained 'F' ratio of 18.80 for adjusted post-test means was greater than the table value of 4.00 for df 1 and 48 required for significance at 0.05 level of confidence on systolic blood pressure. The results of the study indicated that there was a significant difference among the adjusted post-test means of mountaineering training group (MTG) and control group (CG) on systolic blood pressure. The analysis of dependent "t"-test on the data obtained for systolic blood pressure of the pre-test and post-test means of Mountaineering training and control groups have been analyzed and presented in table 2.

**Table 2:** The summary of mean and dependent "t" test for the pre and post tests on systolic blood pressure of mountaineering training group and control groups

	Training Group		Control Group	
	Mean	SD (±)	Mean	SD (±)
Pre-test	123.00	1.60	122.72	1.06
Post-test	119.68	3.96	122.80	1.04
"t" value	4.45*		0.492	

\*Significant at 0.05 level of confidence systolic blood pressure scores in mmHg. (Table value required for significance at 0.05 level for "t" test with df 24 is 1.71).

The table 1 shows that the mean difference values between mountaineering training group and control group are 4.45 and 0.492 respectively. When the control group (CG) compared with experimental groups, the mean differences were 4.45 and 0.492 which were significant at 0.05 level of confidence. Hence, there was significant difference between control group (CG) and experimental groups in systolic blood pressure among moderate inhabitants. The results of the study showed

that there were a significant difference between mountaineering training group (MTG) and control group (CG), the training produced the similar effects on systolic blood pressure. The pre, post and adjusted post test means values of mountaineering training group (MTG) and control group (CG) on systolic blood pressure are graphically represented in the Figure – 1.

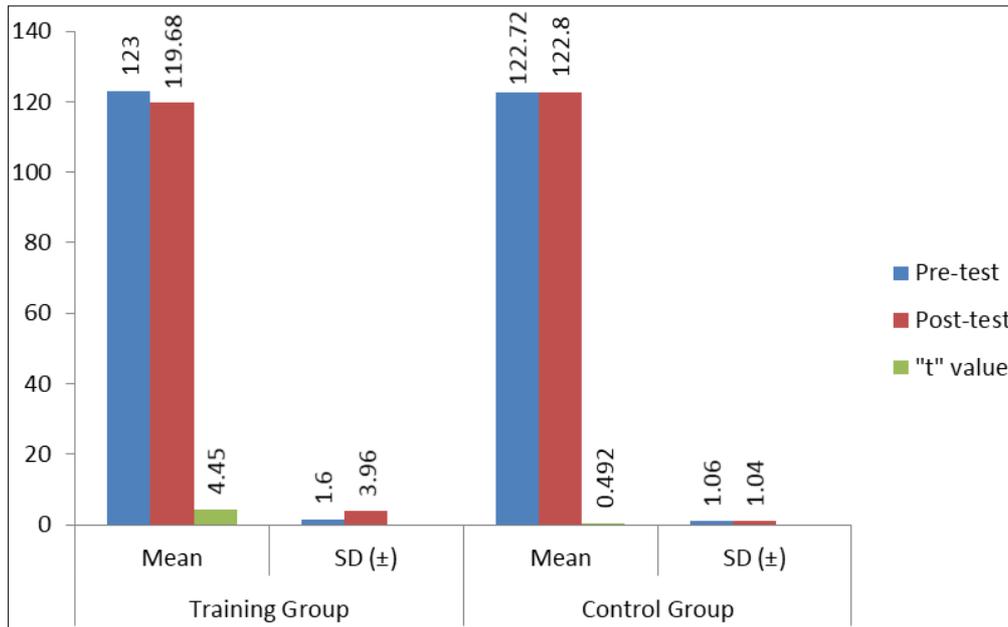


Fig 1

**Table 3:** Analysis of Covariance for the Pre, Post and Adjusted Post Test Mean Values of mountaineering training and Control Group on Diastolic Blood Pressure

	Training Group	Control Group	SoV	SS	df	MS	"F" Ratio
Pre-test Mean	80.88	81.12	BG	0.72	1	0.72	0.02
SD (±)	2.16	1.48	WG	156.28	48	3.44	
Posttest Mean	78.68	81.04	BG	69.62	1	69.62	25.24*
SD (±)	1.97	1.27	WG	132.40	48	2.75	
Adjusted Posttest Mean	78.78	0.94	BG	58.05	1	58.05	157.61*
			WG	17.31	47	0.36	

\*Significant at 0.05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 1 & 48 are 4.00 respectively)

The table -2 shows that the pre-test mean values on diastolic blood pressure of mountaineering training group (MTG) and control group (CG) are 80.88 and 81.12 respectively. The obtained 'F' ratio 0.02 for pre-test scores was less than the table value 4.00 for df (1, 48) that indicates there is no significant difference on diastolic blood pressure between groups. The post-test mean values on diastolic blood pressure of mountaineering training (MTG) and control group (CG) are 78.68 and 81.04 respectively. The obtained 'F' ratio 25.25 for post-test scores was greater than the table value 4.00 for df 1 and 48 required for significance at 0.05 level of confidence on diastolic blood pressure. The adjusted post-test means of

mountaineering training (MTG) and control group (CG) are 78.78 and 0.94 respectively. The obtained 'F' ratio of 157.61 for adjusted post-test means was greater than the table value of 4.00 for df 1 and 48 required for significance at 0.05 level of confidence on diastolic blood pressure. The results of the study indicated that there was a significant difference among the adjusted post-test means of mountaineering training group (MTG) and control group (CG) on diastolic blood pressure. Since the obtained 'F' ratio value was significant further to find out the paired mean difference, "t" test was employed and presented in Table- 4.

**Table 4:** The summary of mean and dependent "t" test for the pre and post tests on diastolic blood pressure of mountaineering training group and control groups

	Training Group		Control Group	
	Mean	SD (±)	Mean	SD (±)
Pre-test	80.88	2.16	81.12	1.48
Post-test	78.68	1.97	81.04	1.27
"t" value	26.94*		0.464	

\*Significant at 0.05 level of confidence diastolic blood pressure scores in mmHg. (Table value required for significance at 0.05 level for "t" test with df 24 is 1.71).

The table 2 shows that the mean difference values between mountaineering training group (MTG) and control group (CG) are 26.94 and 0.464 respectively. Which are greater than the confidence interval value at 0.05 level of confidence. The results of the study showed that there were a significant difference between mountaineering training group (MTG) and control group (CG) on diastolic blood pressure. The results of the study showed that there were a significant difference

between mountaineering training group (MTG) and control group (CG) on diastolic blood pressure. It may be concluded from the results that there was a statistically significant difference existed between adjusted post means of experimental groups and the control group (CG). The pre, post and adjusted post test means values of field training group and control group on diastolic blood pressure are graphically represented in the Figure –2.

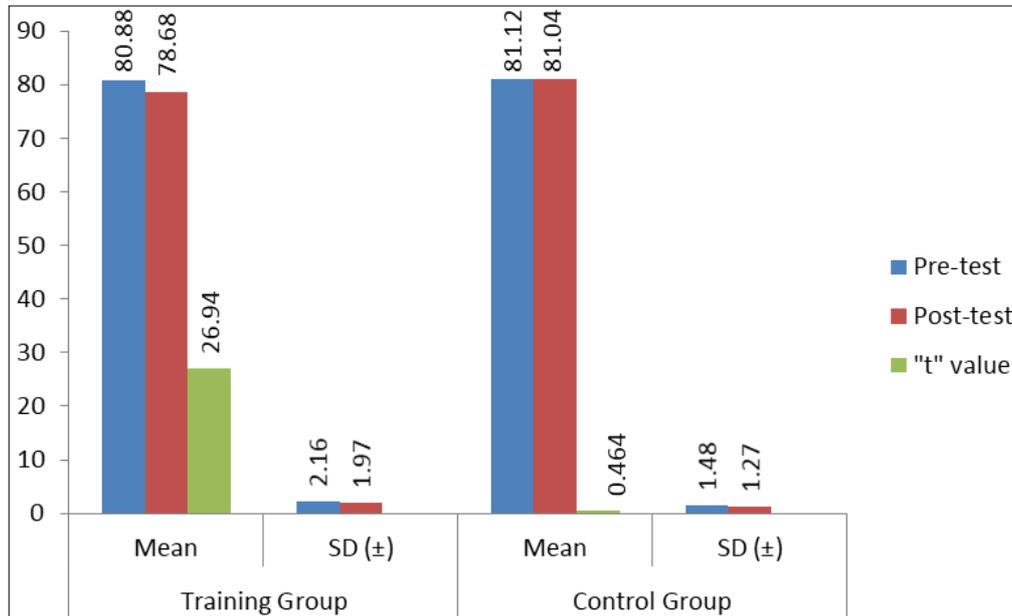


Fig 2

**Discussion on findings**

The result of the study revealed that the training group has significant improvement in physiological variable among moderate inhabitants after the systematic mountaineering training program. The physiological variables showed significant improvement as the planned training program shows the significant effect. Hence mountaineering training program of twelve weeks was satisfactory for physiological variable.

**Conclusion**

It was concluded that the mountaineering training program is one of the best training method for improving physiological variable like blood pressure for moderate inhabitants because there was a significant difference among mountaineering training group and control group in systolic blood pressure and there was also significant difference among mountaineering training group and control group in diastolic blood pressure. So mountaineering training is effective for improving physiological variables like blood pressure.

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