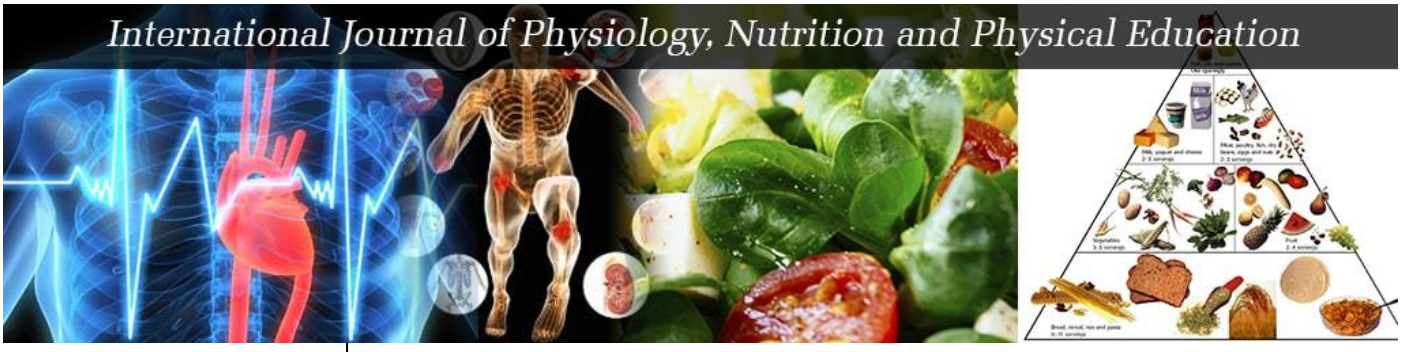

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Effects of bio-motor abilities training and meditation on hemoglobin and hematocrite among intermediate sports persons

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Abstract
The main purpose behind this study was to find out the effects of biomotor abilities training and meditation on hemoglobin and hematocrite i.e. hemoglobin and hematocrite among intermediate sports persons.32 students were selected from SGGSWU by purposive method, age ranged from 18 to 25 years. All of them took part in routine program as per schedule of university. All the subjects were further divided randomly in to four groups i.e. physical training group (PTG), physical training and meditation group (PTMG), meditation group (MG) and control group (CG) and followed the specific schedule except the control group. Total twelve weeks of training were given to the subjects for six days in a week for one hour. For this study data were collected on the basis of time series design (pre-before training; during-after six weeks; post-after completion of twelve weeks of training) and to analyze the data two-way mixed ANOVA were applied at 0.05 level of significance through SPSS. The results of the study indicate that the 12 weeks of biomotor abilities training program having significant difference in hemoglobin variable after bio-motor abilities and meditation. The result of hemoglobin test was significant at post-test when it was compared with pre-test and during and post-test but there were no significant differences when it was compared with pre and during test. Hence, the impact of training has been seen significant after completion of twelve weeks of training. Further groups were examined and the result shows no significant differences was found when it was compared with PTG and PTMG, PTG and MG, PTG and CG, PTMG and MG, PTMG and MG, PTMG and CG and lastly MG and CG. The result shown for the hematocrit indicates that there was a significant difference in hematocrit variable after bio-motor abilities and meditation. The result of hematocrit test was significant at post-test when it was compared with pre-test; during and post-test but there were no significant differences when it was compared with pre and during test. Hence, the impact of training has been seen significant after completion of twelve weeks of training. Further groups were examined and the result shows no significant differences was found when it was compared with PTG and PTMG, PTG and MG, PTG and CG, PTMG and MG, PTMG and MG, PTMG and CG and lastly MG and CG. Among entire group's overall performance was better in physical training and meditation group (PTMG).

Keywords: Bio-motor abilities, meditation, training, hemoglobin and hematocrite and hematological variable

Introduction
The world of sports and games is always growing and changing in the modern era. The world is changing incredibly quickly in the twenty-first century, and sports are no exception. As other industries grow, so do sports, and these changes are made in response to the needs and expectations of the current situation, which is based on research. Athlete fitness in sports competition is influenced by a wide range of factors, the most important of which are combinations of strength, speed, endurance, flexibility, agility, and balance - all of which are components of bio-motor abilities. Athletic performance is entirely dependent on an athlete's fitness level. These skills aid in an athlete's professional success, assist them realize long-held goals, and support them in sustaining their current level of performance. The majority of sports have a strong Bio-Motor component, and these talents are essential for executing the various skills required to win or participate in the particular sport. For instance, endurance is typically regarded as the primary Bio-Motor ability required for success in long-distance running.

Similar to this, each sport has a dominant Bio-Motor skill. However, recent studies indicate that a few of the Bio-Motor talents may have an impact on athletic activity. When engaging in any physical exercise, the body responds according to the athlete's potential, which is entirely based on their physiological and hematological variables. One of them is hematocrite, which is the proportion of red blood cells in blood, and haemoglobin, which carries red blood cell to the working muscles during exercise. So, the rationale of the study was effect of bio-motor abilities training and meditation on hematocrite and hemoglobin among intermediate sports persons.

Methodology

Selection of the subject

For this study 32 male intermediate sports persons of BPED and BPES class were selected as a subject by using purposive sampling technique from Department of Physical Education & Sports Technology of Shri Guru Granth Sahib World University Fatehgarh Sahib, Punjab. The age of the subject ranged between 18 to 25 years and almost having the same level and found physically fit. All of them were found physically fit and involved in university curriculum as per routine of department.

Selection of Variables

Dependent Variable (Physiological Variables)	Independent Variable
Hematocrite	Biomotor abilities training and meditation
Hemoglobin	

Administration of the test

Haematological variables

- Haemoglobin and Hematocrit.
- Procedure and Scoring.

Blood was tested by the experts in human pathological lab of Patiala, Punjab named, SAHI CLINICAL LAB by Lab Technologist Parminder Singh (B.SC. MLT)

Treatment procedure

- **Experimental Group-1 (Physical Training):** This Group were involved in the physical exercise as per the protocol of this study.
- **Experimental Group-2 (Meditation):** Experimental group-2 were involved in meditation only.
- **Experimental Group-3 (Physical training and Meditation):** Experimental group-3 were involved in both physical exercise and meditation as per the protocol of this study.
- **Control Group- (CG):** No. involvement of training program.

Statistical technique

- To examine the differences of gathered data were analyzed through two way mixed ANOVA statistical tools, for that SPSS were employed at 0.05 level of significance.

Analysis of data and results of the study

Table 1: Mauchly's Test for the assumptions of sphericity of HGB (hemoglobin) after twelve weeks of training

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	DF	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.649	11.692	2	.304	.740	.855	.500

*May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Table 1 indicates that the value of Mauchly's test statistics was insignificant for the score of HGB of the athletes to the biomotor abilities and meditation training after twelve weeks. As the P-value (.285) was higher than 0.05 at 5% level of significance. So, in this case it can be asserted that assumption of sphericity was considered to be fulfilled.

As the mauchly's test statistics was found insignificant in the given table, the researcher has employed two way mixed ANOVA to test the within subject effect of biomotor abilities and meditation training on HGB after twelve weeks. The result has been presented in table 2.

Table 2: Test of within subject effects of hemoglobin for biomotor abilities training and meditation

Source		Type III Sum of Squares	DF	Mean Square	F	Sig.
Time	Sphericity Assumed	3.443	2	1.722	53.535	.000
	Greenhouse-Geisser	3.443	1.480	2.327	53.535	.000
	Huynh-Feldt	3.443	1.710	2.013	53.535	.000
	Lower-bound	3.443	1.000	3.443	53.535	.000
time * GROUPS	Sphericity Assumed	1.616	6	.269	8.376	.000
	Greenhouse-Geisser	1.616	4.440	.364	8.376	.000
	Huynh-Feldt	1.616	5.131	.315	8.376	.000
	Lower-bound	1.616	3.000	.539	8.376	.000
Error(time)	Sphericity Assumed	1.801	56	.032		
	Greenhouse-Geisser	1.801	41.437	.043		
	Huynh-Feldt	1.801	47.887	.038		
	Lower-bound	1.801	28.000	.064		

The result shown in above table indicate that there was a significant difference in hemoglobin variable after biomotor abilities and meditation training of twelve weeks, as the P-value (.000) was less than 0.05 level of significance. Hence,

on the basis of result it can be concluded that twelve weeks of bio motor abilities and meditation training improve the hemoglobin of the athletes. In order to see the pairwise comparison of pre-test, during test and post, test the comparison table expressed in table 3.

Table 3: Pairwise Comparisons of hemoglobin at different time interval 1-pre, 2-during, 3-post

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig. [b]	95% Confidence Interval for Difference [b]	
					Lower Bound	Upper Bound
1	2	226	.034	.563	-.202	-.029
	3	-.447*	.056	.000	-.590	-.304
2	1	226	.034	.563	.029	.202
	3	-.331*	.041	.000	-.436	-.226
3	1	.447*	.056	.000	.304	.590
	2	.331*	.041	.000	.226	.436

* Adjustment for multiple comparisons: Sidak.

In the above table no 3 Sidak corrections was applied for pairwise comparison and the result of hemoglobin among three time trail pre-test (1) (before the training) during test (2) (after completion of six weeks of training) and post-test (3) after completion of twelve weeks of training.

The analysis shows that the pairwise comparison for effects of trainings on hemoglobin after 12 weeks reveals the significant effect of training on hemoglobin was found, when it was compared with pre-test and post-test as P-value (.000) during test and post-test as the P- value (.000) which was less than 0.05 level of significance but there were no significant difference found when it was compared with pre-test and during test as the P-value (.563). In order to see between subject effects, this has been presented in table 4.

Table 4: Tests of between-subjects effects of hemoglobin among PTG, PTMG, MG and CG for different time trial i.e. Pre, during and Post

Source	Type III Sum of Squares	DF	Mean Square	F	Sig.
Groups	8.20	3	2.73	.74	.533
Error	102.45	28	3.65		

The results shown in the above table indicate that there was no significant difference in the hemoglobin among different groups after twelve weeks of training effect as the P- value (.533) was not less than 0.05 level of significance. Hence, on the basis of results it can be concluded that twelve weeks of biomotor abilities training and meditation proved for no improvement of hemoglobin among groups.

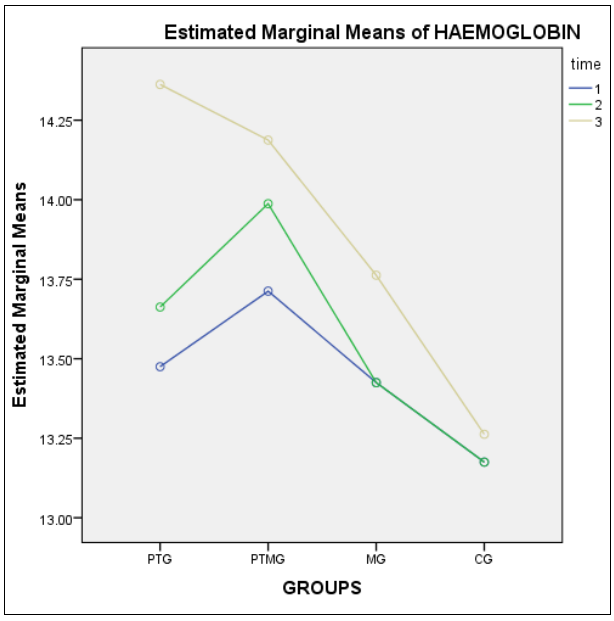

Fig 1: Graphical representation of hemoglobin of PTG, PTMG, MG and CG at different time trial

Hematocrite

Table 5: Mauchly's Test for the assumptions of sphericity of HCT (Hematocrit) after twelve weeks of training

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	DF	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.240	38.538	2	.072	.568	.640	.500

*May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Table 5 indicates that the value of Mauchly's test statistics was insignificant for the score of Hematocrit (HCT) of the athletes to the bio-motor abilities and meditation training after twelve weeks. As the P-value (.072) was higher than 0.05 at 5% level of significance. So, in this case it can be asserted that assumption of sphericity was considered to be fulfilled.

As the Mauchly's test statistics was found insignificant in the given table, the researcher has employed two way mixed ANOVA to test the within subject effect of bio-motor abilities and meditation training on HCT after twelve weeks. The result has been presented in table 6.

Table 6: Test of within subject effects of hematocrit for biomotor abilities training and meditation

Source		Type III Sum of Squares	DF	Mean Square	F	Sig.
Time	Sphericity Assumed	8.918	2	4.459	28.503	.000
	Greenhouse-Geisser	8.918	1.136	7.848	28.503	.000
	Huynh-Feldt	8.918	1.279	6.972	28.503	.000
	Lower-bound	8.918	1.000	8.918	28.503	.000

time * GROUPS	Sphericity Assumed	.854	6	.142	.910	.494
	Greenhouse-Geisser	.854	3.409	.251	.910	.457
	Huynh-Feldt	.854	3.837	.223	.910	.465
	Lower-bound	.854	3.000	.285	.910	.449
Error(time)	Sphericity Assumed	8.761	56	.156		
	Greenhouse-Geisser	8.761	31.817	.275		
	Huynh-Feldt	8.761	35.816	.245		
	Lower-bound	8.761	28.000	.313		

The result shown in above table indicate that there was a significant difference in hematocrit after bio-motor abilities and meditation training of twelve weeks, as the P-value (.000) was less than 0.05 level of significance. Hence, on the basis of result it can be concluded that twelve weeks of bio motor abilities and meditation training improve the hematocrit of the athletes. In order to see the pairwise comparison of pre-test, during test and post, test the comparison table expressed in table 7.

Table 7: Pairwise Comparisons of Hematocrit (HCT) at different time interval 1-pre, 2-during, 3-post

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig. [b]	95% Confidence Interval for Difference [b]	
					Lower Bound	Upper Bound
1	2	-.153*	.048	.051	-.276	-.031
	3	-.709*	.131	.000	-1.041	-.377
2	1	.153*	.048	.051	.031	.276
	3	-.556*	.100	.000	-.809	-.304
3	1	.709*	.131	.000	.377	1.041
	2	.556*	.100	.000	.304	.809

* Adjustment for multiple comparisons: Sidak

In the above table no 88 Sidak corrections was applied for pairwise comparison and the result of hematocrit (HCT) among three time trail pre-test (1) (before the training) during test (2) (after completion of six weeks of training) and post-test (3) after completion of twelve weeks of training.
The analysis shows that the pairwise comparison for effects of trainings on HCT after 12 weeks reveals the significant effect of training on HCT was found, when it was compared with pre-test and post-test as P-value (.000) during test and post-test as the P- value (.000) which was less than 0.05 level of significance but there was no significant difference found when it was compared with pre-test and during test as the P-value (.051) which was more than 0.05 level of significance. In order to see between subject effects, this has been presented in table 8.

Table 8: Tests of Between-Subjects Effects of Hematocrit (HCT) among PTG, PTMG, MG and CG for different time trial i.e. Pre, during and Post

Source	Type III Sum of Squares	DF	Mean Square	F	Sig.
GROUPS	201.504	3	67.168	1.196	.329
Error	1572.279	28	56.153		

The results shown in the above table indicate that there was no significant difference in the hematocrit among different groups after twelve weeks of training effect as the P- value (.329) was more than 0.05 level of significance. Hence, on the basis of results it can be concluded that twelve weeks of bio-motor abilities training and meditation proved for no improvement in hematocrit among groups.

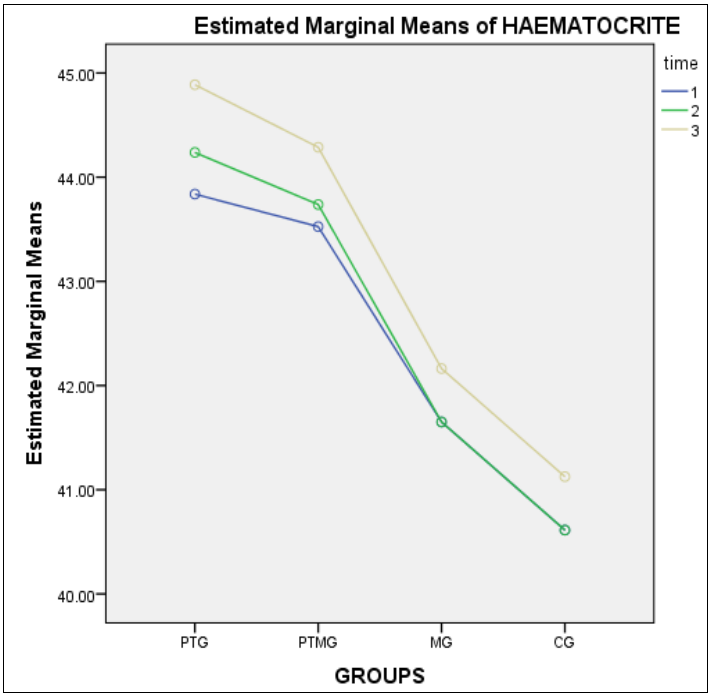

Fig 2: Graphical representation of WBC of PTG, PTMG, MG and CG at different time trial

Discussion on Findings

The result shown for the hemoglobin indicates that there was a significant difference in hemoglobin variable after bio-motor abilities and meditation. The result of hemoglobin test was significant at post-test when it was compared with pre-test and during and post-test but there were no significant differences when it was compared with pre and during test. Hence, the impact of training has been seen significant after completion of twelve weeks of training. Further groups were examined and the result shows no significant differences was found when it was compared with PTG and PTMG, PTG and MG, PTG and CG, PTMG and MG, PTMG and MG, PTMG and CG and lastly MG and CG. Hence, on the basis of result it can be concluded that twelve weeks of bio motor abilities training and meditation has been not significantly improve the hemoglobin content in different groups of the athletes those participated in physical training and meditation group and meditation group but as per mean value physical training and meditation group (PTMG) having higher hemoglobin count after the completion of twelve weeks of training. The result of hemoglobin may be because of nature of training protocol, diet, environmental factor and other factor like iron reach food etc. Literature also suggested that the improvement in hemoglobin due to exercises and nutrition which increases the total hemoglobin count which also increases the oxygen carrying capacity in the individual.

Hematocrit

The result shown for the hematocrit indicates that there was a significant difference in hematocrit variable after bio-motor abilities and meditation. The result of hematocrit test was significant at post-test when it was compared with pre-test; during and post-test but there were no significant differences when it was compared with pre and during test. Hence, the impact of training has been seen significant after completion of twelve weeks of training. Further groups were examined and the result shows no significant differences was found when it was compared with PTG and PTMG, PTG and MG, PTG and CG, PTMG and MG, PTMG and MG, PTMG and CG and lastly MG and CG. Hence, on the basis of result it can be concluded that twelve weeks of bio motor abilities training and meditation has been not significantly improve the hematocrit content in different groups of the athletes those participated in physical training and meditation group and meditation group but as per mean value physical training group (PTG) having higher hematocrit count after the completion of twelve weeks of training.

The result of the hematocrite shows in the study because of increase in number of red cell in the blood content as hematocrite means the percentage by volume of red cell in the blood. Blood constitutes of RBC, WBC and platelets suspended in plasma. Together, these comprise about 45% of the volume of our blood. So the reason behind the result may be because of variation in the RBC's which was may be due to training and diet.

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