Dr. Mohd Rafiq Ejaz Siddiqui
Associate Professor,
Marathwada Sanskrutik Mandal
College of Physical Education,
Aurangabad, Maharashtra, India

Effect of physical activities and Asana on hematological variables

Dr. Mohd Rafiq Ejaz Siddiqui

Abstract
The objective of this study was to find out the changes in selected hematological variables through Physical exercise, yoga asana and aerobics. For this purpose, thirty Post graduate students of Physical Education were randomly selected as a subjects and name as Physical group, yoga group and aerobics group and were given Physical exercise, yoga asana practice and aerobic dance practice respectively for an hour from 4pm to 5pm in alternative days for twelve weeks. Blood samples from the selected subjects were collected before and after the training period to analyze the changes in hematological variables such as hemoglobin, glucose and cholesterol through laboratory bleed testing. They collected from three groups were statistically analyzed for significance by using analysis of covariance and Post hoc test. The finding of this study showed that there was significant improvement due to the twelve weeks of Physical activity, yoga asanas and aerobics group out performed the asana group and physical groups in selected hematological variables such as hemoglobin, glucose and cholesterol, due to twelve week of aerobics training. The investigator suggests this aerobics dance practice are fun and exciting, using musical rhythms to naturally motivate and thus increasing the efficiency of practice.

Keywords: Physical exercise, yoga, asana, aerobics and hemoglobin, glucose and cholesterol

Introduction
Health is the level of functional and or metabolic efficiency of a living being. Hematology, also spelled as hematology is derived from a Greek word 'haima' which means "blood" is the branch of internal medicine, physiology, pathology, clinical laboratory work, and pediatrics that is concerned with the study of blood, the blood-forming organs and blood diseases (Pal 2011) [6]. Hemoglobin is a protein that is carried by red cells. It picks up oxygen in the lungs and delivers it to the peripheral tissues to maintain the viability of cells. Hemoglobin is made from two similar proteins that "stick together". Each hemoglobin molecule is made up of four heme groups surrounding a globin group. Heme contains iron and gives a red color to the molecule. Blood sugar, also known as blood glucose, is the body's fuel that feeds the brain, nervous system, and tissues (Maton, 1993) [7]. Glucose is the primary source of energy for the body's cells, and blood lipids are primarily a compact energy store. Glucose is transported from the intestines or liver to body cells via the bloodstream, and is made available for cell absorption via the hormone insulin, produced by the body primarily in the pancreas (Chohan, 1994) [3].

Cholesterol is a soft, was-like substance that is a required building block of all cells in the human body. It is produced naturally in the liver and some cholesterol may come from diet. It is carried from the liver to the rest of the body in low density lipoproteins (LDL or "Bad" cholesterol) and back to the liver in high density lipoproteins (HDL or "Good" cholesterol). In addition to producing cell membranes, cholesterol is critical to the production of the hormones estrogen and testosterone as well as vitamin D and bile acids that assist in the proper digestion of fat (Maton, 1993) [7].

Corresponding Author:
Dr. Mohd Rafiq Ejaz Siddiqui
Associate Professor,
Marathwada Sanskrutik Mandal
College of Physical Education,
Aurangabad, Maharashtra, India

Need for the Study
Teacher training refers to the policies and procedures designed to equip prospective teachers with the knowledge, attitudes, behaviors and skills they require to perform their tasks effectively in the classroom, school and wider community. Teacher training to learn the process of educating and teaching others through quality education (Brenowitz, 2003) [8].

The objective of this study was to find out the effect of Physical Activites and asana on hematological variables of Post graduate students of Physical Education.

Hypothesis of the study
It was hypothesized that there would be significant difference in selected hematological variables such as hemoglobin, glucose and cholesterol among physical exercise group, yoga asana group and aerobics group due to twelve weeks of training.

Methodology of the study
For this purpose, thirty Post graduate students of Physical Education were randomly selected as a subjects from Dr. Babasaheb Nandurkar college of Physical Education Yavatmal, HVSKM College of Physical Education Yavatmal named as Physical group, Yoga asana group. There age was ranged between 22-24 years. Physical exercise such as jogging, straching, fast walking, spot jumping, conditioning were given to Physical group. Yoga asana such as Trikonasana, Vrikshasana, Uttanapadasana, Viparita Karani, Shalabhasana, Bhujangasana, Naukasana and Dhanurasana were given to Yoga asana group. Floor aerobic dance to fast beat music were given to the Aerobic group. Training was given as per the schedule to the selected groups for an hour from 4 pm to 5 pm in alternative days for twelve weeks. Blood samples from the selected subjects were collected before and after the training period to analyze the changes in hematological variables such as hemoglobin, glucose and cholesterol through laboratory blood testing.

Statistical technique used
The data collected from three groups were statistical analyzed for significance by using analysis of covariance and Post hoc test. No attempt was made to equate the groups in any manner during the study. Hence to make adjustments for differences in the initial means and test the adjusted post test means for significant difference the analysis of covariance was used.

Analysis and interpretation of data

Table 1: Computation of Analysis of Covariance on Hemoglobin

Test	Physical Exercise Group	Yoga asana Group	Aerobic Group	Sources of Variance	Sum of Squares	df	Mean Square	Obtained F
Pre Test	11.7	11.45	11.38	Between	1.12	2	0.56	0.75
				Within	42.54	57	0.75	
Post Test	13.3	13.54	14.84	Between	27.65	2	13.83	9.52*
				Within	82.82	57	1.45	
Adjusted Post Test	13.14	13.58	14.95	Between	34.87	2	17.44	17.97*
				Within	54.33	56	0.97	
Mean Gain	1.6	2.09	3.47					

Table f-ratio at 0.05 level of confidence for 2 and 57(df) is 3.23*
*Significant at .05 level of confidence

Table 2: Scheffe's Post HOC Test on Hemoglobin

Adjusted Test Mean				Required CI
Physical Exercise Group	Yoga Asana Group	Aerobic Group	Mean Difference	
13.14	13.58	-	0.44	0.78
13.14	-	14.95	1.81*	0.78
-	13.58	14.95	1.37*	0.78

*Significance.

Analysis of covariance and Scheff's Post -hoc test Table 1 and 2 respectively showed that there is significant difference was found in hemoglobin between aerobic and physical exercise groups and also between aerobic and yoga asana groups and results indicate that there is no significant difference was found in hemoglobin between aerobics and yoga asana groups. Therefore it is proved that aerobics group increased the level of hemoglobin when compared to other two groups,

Table 3: Computation of Analysis of Covariance on Blood Glucose

Test	Physical Exercise Group	Yoga asana Group	Aerobic Group	Sources of Variance	Sum of Squares	df	Mean Square	Obtained F
Pre Test	98.4	98.05	98.3	Between	1.3	2	0.65	0.01
				Within	6199.95	57	108.77	
Post Test	94.95	93.5	87.4	Between	642.1	2	321.05	3.38*
				Within	5416.75	57	95.03	
Adjusted Post Test	94.82	93.68	87.36	Between	646.25	2	323.13	36.89*
				Within	490.55	56	8.76	
Mean Gain	3.45	4.55	10.9					

Table value at 0.05 level of confidence for 2 and 57(df) is 3.23
*Significance at .05 level of confidence

Table 4: Scheffe's Post HOC Test on Blood Glucose

Adjusted Test Mean				Required CI
Physical Exercise Group	Yoga Asana Group	Aerobic Group	Mean Difference	
94.82	93.68	-	1.14	2.33
94.82	-	87.36	7.46*	2.33
-	93.68	87.36	6.32*	2.33

*Significance

Analysis of covariance and Scheffe's Post-hoc test Tables 3 and 4 respectively showed that there is significant difference was found in blood glucose between aerobic and Physical exercise groups and also between aerobic and yoga asana groups and results indicates that there is no significant difference was found in blood glucose bewteen Physical exercise and yoga asana groups. Therefore it is proved that aerobics decreased the level of blood glucose to normal when compared to other two groups.

Table 5: Computation of Analysis of Covariance on Total Cholesterol

Test	Physical Exercise Group	Yoga asana Group	Aerobic Group	Sources of Variance	Sum of Squares	df	Mean Square	Obtained F
Pre Test	224.4	224.35	225	Between	5.23	2	2.62	0.03
				Within	4769.35	57	83.67	
Post Test	210.95	212.2	204	Between	780.7	2	390.35	5.40*
				Within	4118.15	57	72.25	
Adjusted Post Test	211.09	212.37	203	Between	877.43	2	438.72	16.58*
				Within	1481.71	56	26.46	
Mean Gain	13.45	12.15	21					

Table value at 0.05 level of confidence for 2 and 57(df) ia 3.23*
*Significance at .05 level of confidence

Table 6: Scheffe's Post HOC Test on Test Cholesterol

Adjusted Test Mean				Required CI
Physical Exercise Group	Yoga Asana Group	Aerobic Group	Mean Difference	
211.09	212.37	-	1.29	4.05
211.09	-	203.69	7.40*	4.05
-	212.37	203.69	8.68*	4.05

*Significance

Analysis of covariance and Scheffe's Post-hoc test Tables 5 and 6 respectively showed that there is significant difference was found in total cholesterol between aerobic and Physical exercise groups and also between aerobic and yoga asana groups and results indicates that there is no significant difference was found in blood glucose between Physical exercise group and yoga asana groups. Therefore it is proved that aerobics group decreased the level of total cholesterol when compared to other two groups.

Discussion
As the results implied that there was significant difference in the improvement of selected hematological variables such as hemoglobin, glucose and cholesterol among Physical exercise group, yoga asana group and aerobics group, the stated hypothesis was accepted at .05 level of significance.

Conclusion
The findings of this study showed that there was significant improvement due to the twelve weeks of Physical exercise, yoga asanas and aerobics practice among the selected women teacher trainees, The aerobics group outperformed both yoga asana and physical exercise groups in selected hematological variables such as hemoglobin, glucose and cholesterol, due to twelve week of aerobics training This study suggests the aerobics practice with a minimum of three times a week for at least thirty minutes to get full benefits of aerobic dance workouts and to achieve a better level of fitness. Aerobics is a fun activity that helps in strengthening the body, and gives energy to carry out day to day activities effectively and efficiently among the teacher trainees which in turn shapes the lives of the students and the progress of the Nation.

References
1. Blackwell ED Jr. Physical Fitness is a central curriculum issue, Journal of Physical Education, Recreation and Dance; c1990. p. 1-12.
2. Carlson J. The multimodal effect of physical exercise, Journal of Elementary School Guidance and Counseling 1982;16:304-309.
3. Chohan IS, Nayar HS, Thomas P, Geetha NS. Influence of asana on blood coagulation, Journal of the International Society on Thrombosis and Haemostasis, 1994;30:51(2):16-7.
4. Cooper, Kenneth C. The New Aerobics; The basics, 6th ed. San Francisco: Pearson Education, Inc; c2005. p. 25-26.
5. Hinkle J. The Aerobic Gymnastics, FIG-Federation International de Gymnastics; c2012, Retrieved from http://www.ericdigests.org/1992-3/fitness.htm.
6. Pal A, Srivastava N, Tiwari S, Kumar K. Effect of Yogic practices on lipid profile and body fat composition in patients of coronary artery disease, Complement Therapies Medline. 2011;19(3):122-7.
7. Maton, Anthea, Jean Hopkins, Charles William McLautghlin. Human Biology and Health, Englewood Ckiffs, New Jersey, USA: Prentice Hall; c1993, ISBN 0-13-981176-1.
8. Brown SP, Brenowitz SD, Regehr WG. Brief presynaptic bursts evoke synapse-specific retrograde inhibition mediated by endogenous cannabinoids. Nature neuroscience. 2003 Oct 1;6(10):1048-1057.