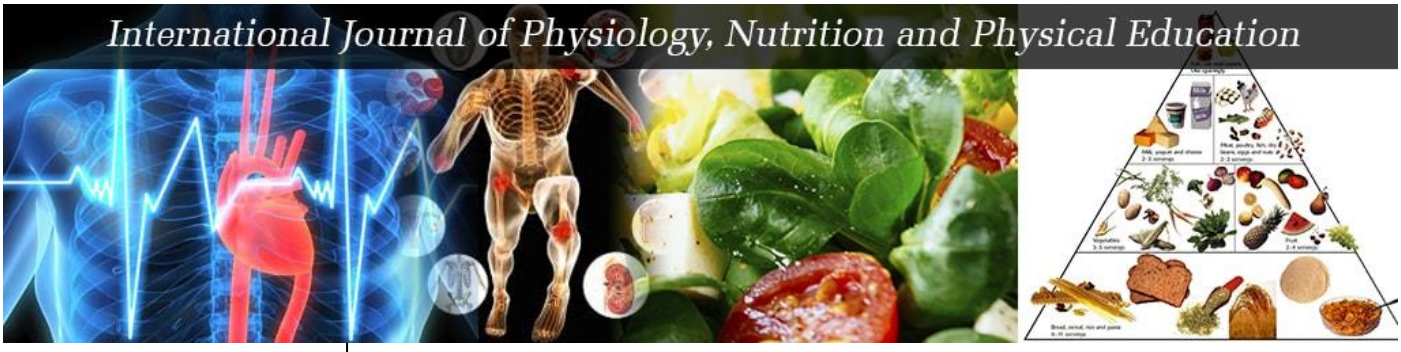

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A comparative study to determine the affectiveness of Bhastrika pranayama on hematological variables in female athletes

Dr. Baljinder Singh Bal and Parmjit Kaur

Abstract
The purpose of this study was to examine the effect of Bhastrika Pranayama on Hematological variables. For the purpose of the study, fifteen (N=15), female athletes of Department of Physical Education (T), Guru Nanak Dev University, Amritsar (Punjab) between the age group of 21-29 years were selected. Student t test for paired samples was utilized to compare the means of the pre-test and the post-test. Based on the analysis of the results obtained, we conclude that the insignificant differences were found in Hematological variables. No significant differences were noted in Hemoglobin, Total WBC Count, R.B.C. Count of university level girls.

Keywords: Bhastrika, hematological, WBC, RBC

Introduction
Prana is a subtle aspect of the body. It has a visible aspect which is the air we breath and an invisible aspect, which is the energy that flows in the body through various channels and sustains it. It is responsible for our vitality and dynamism (chaitanyam). Without prana beings cannot be alive. Prana also connects the gross body (Annamaya Kosa) with the mental body (Manomaya Kosa). Hence, classical yoga recommends controlled breathing (pranayama) to restrain the senses, purify the mind and body and arrest the modifications of the mind. Prana is the support for the body. Hence the Upanishads describe it often as the soul of the gross body and equate it with Atman or the essence of Brahman. Prana controls all physical tasks for example, the breath, the supply of oxygen, digestion, elimination and much more. The function of the human body is much like a transformer, receiving energy from the Universal flow of Prana, distributing that energy, and then eliminating it. As we develop the ability to control Prana, we gain harmony and health, of both body and mind. In addition to this, with long and consistent practice an expansion of consciousness is experienced.

Methods: For the purpose of the study, fifteen (N=15), female athletes of Department of Physical Education (T), Guru Nanak Dev University, Amritsar (Punjab) between the age group of 21-29 years were selected. The details of average Age, Body Weight and Body Height of subjects are exhibited in table-1.The fifteen subjects (N=15), were purposively assigned for this:
Female (n=15)
All the subjects were informed about the objective and protocol of the study.

Table 1: Distribution and Demographics of Female athletes (N=15) of Department of Physical Education (T), Guru Nanak Dev University, Amritsar.

Variables	Sample Size (N=15)
	Female (N=15)
	Mean± S.D.
Age (yr)	24.07±2.37
Body Weight (kg)	158.73±4.85
Body Height (cm)	55.60±8.97

N; sample size, SD; standard deviation, yr; Years, kg; kilograms, cm; Centimetre's'.

The details of average Age, Body Weight and Body Height of female athletes of Department of Physical Education (T), Guru Nanak Dev University, Amritsar (Punjab)

Results

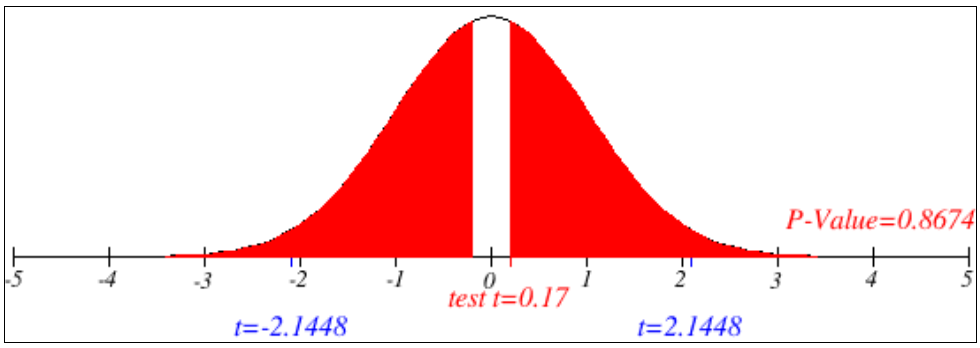
Table 2: Descriptive statistics (Mean & Standard Deviation) and paired sample t-test of Hematological Variables i.e., Hemoglobin, Total WBC Count, R.B.C. Count, Platelets Count of female athletes of Guru Nanak Dev University.

Group	Number	Mean	Standard Deviation	Standard Error of the Mean	t-value	*p*-value
Hemoglobin						
Experiment (Pre-test)	15	11.52	0.75	0.19	0.17	0.86
Experimental (Post-test)	15	11.49	0.66	0.17		
Total WBC Count						
Experiment (Pre-test)	15	8193.33	817.20	211.00	1.61	0.12
Experimental (Post-test)	15	7646.67	1004.18	259.28		
R.B.C. Count						
Experiment (Pre-test)	15	3.85	0.31	0.08	1.69	0.11
Experimental (Post-test)	15	3.96	0.27	0.07		
Platelets Count						
Experiment (Pre-test)	15	2.84	0.34	0.08	1.53	0.14
Experimental (Post-test)	15	2.65	0.33	0.08		

2. (a) Hemoglobin

A glance at Table 2 shows the Mean and Standard Deviation values of Hemoglobin of pre-test and post-test of female athletes was 11.52±0.75 and 11.49±0.66 respectively. The t-value and p-value in case of female athletes was 0.17 and 0.86 as show in the Figure 2 (a).

No significant differences were noted between pre-test and post-test in Hemoglobin since the calculated value of (t = 0.17) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance.

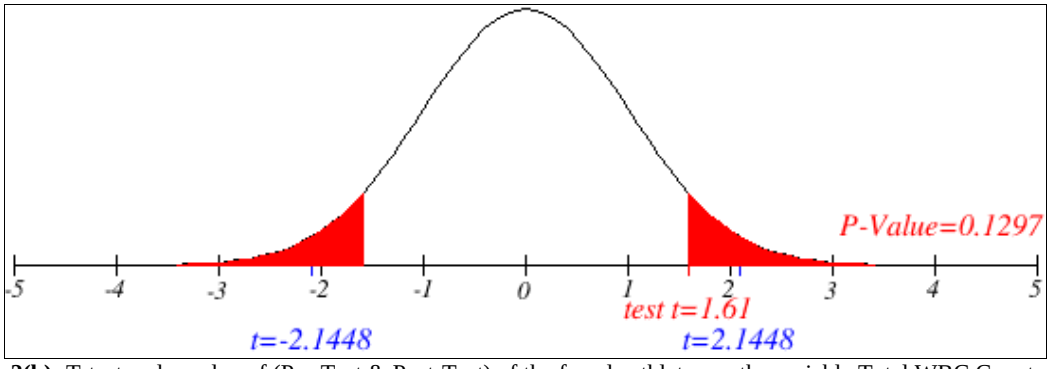


2(a): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable Hemoglobin.

2. (b) Total WBC Count

A glance at Table 2 shows the Mean and Standard Deviation values of Total WBC Count of pre-test and post-test of female athletes was 8193.33±817.20 and 7646.67±1004.18 respectively. The t-value and p-value in case of female athletes was 1.61 and 0.12 as show in the Figure 2(b).

No significant differences were noted between pre-test and post-test in Total WBC Count since the calculated value of (t = 1.61) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance.

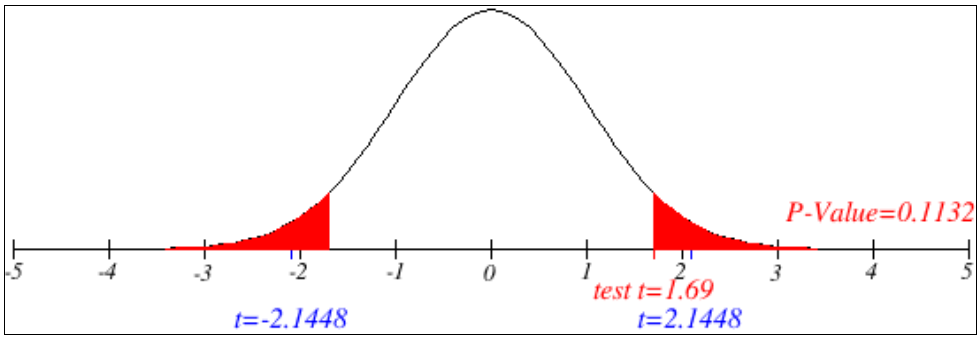


2(b): T-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable Total WBC Count.

2. (c) R.B.C. Count

A glance at Table 2 shows the Mean and Standard Deviation values of R.B.C. Count of pre-test and post-test of female athletes was 3.85±0.31 and 3.96±0.27 respectively. The t-value and p-value in case of female athletes was 1.69 and 0.11 as show in the Figure 2 (c).

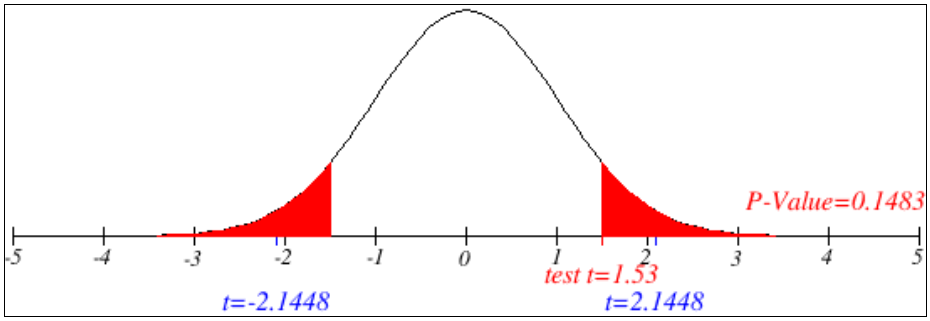
No significant differences were noted between pre-test and post-test in R.B.C. Count since the calculated value of (t = 1.69) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance.



2(c): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable R.B.C. Count.

2. (d) Platelets Count

A glance at Table 2 shows the Mean and Standard Deviation values of Platelets Count of pre-test and post-test of female athletes was 2.84±0.34and 2.65±0.33 respectively. The t-value and p-value in case of female athletes was 1.53 and 0.14 as show in the Figure 2(d).



2(d): T-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable Platelets.

No significant differences were noted between pre-test and post-test in Platelets Count since the calculated value of (t = 1.53) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance.

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