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STUDY OF SELECTED PHYSIOLOGICAL PARAMETERS AMONG THE STUDENTS OF DIFFERENT AGE GROUPS

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Abstract

The purpose of the study was to compare Heart Rate, Vital Capacity, Respiratory Rate, Total Body Weight, Body fat and Lean body mass among the different age groups of 8 to 9 years, 10 to 11 years and 12 to 14 years. Total 90 students; 30 from each group were selected from H.V.P.M's Ashram shala using Simple Random Sampling Method. Finding revealed that there were significant differences in selected variables among the three different age groups of students as Resting Heart Rate (F = 46.50), Respiratory Rate (F = 100.00), Vital Capacity (F = 377.2), Body Fat Weight (F= 60.09) and Lean Body Weight (32.7) were much higher than the required value for F – ratio to be significant 0.05 level with (2 and 89) degrees of freedom.

Keywords: Heart Rate, Vital Capacity, Respiratory Rate, Body fat Weight and Lean Body Weight.

Introduction

The wealth of nation resides in the health and vitality of its people. Every nation is increasingly concerned about physical fitness of its citizen. Physical fitness is our most priceless asset, whether one considered of it from the point of beauty, strength, enjoyment of health or ability to do work.

People who are physically fit look better, feel better and posses the good health necessary for a happy and full life. Physical fitness is one's richest possession it cannot be purchased, it has to be earned through daily routine of physical exercise.

Adequate level of physical fitness should be developed early in life and then continuously maintained through regular exercises, and the physical fitness is influenced by many factors like physiological factors, environmental factors, climate, diet etc.

Henceforth, health, vitality and long life are desirable goals for everyone but they are not achieved without effort. Because of many habits of modern life do more to diminish health than to increase it. If one is resolved to take a positive attitude towards one's health and well being, and to prevent problems, rather than simply treating them as and when they occur, then physical fitness must be an essential part of one's life.

Method:

Participants

In this study, 3 (three) different groups were formed on the basis of subjects' age i.e. group A – 8 to 9 years, group B- 10 to 11 years and, group C-12 to 14 years. Total 90 students; 30 from each group were selected from H.V.P.Mandal's Ashram shala using Simple Random Sampling Method.

Tools and techniques

Heart Rate was measured by putting finger tips on the redial artery to get the beats of the subjects and total number of beats counted in one minute was recorded. Wet Spirometer was used to measure Vital Capacity and scores were recorded in litters. For Respiratory Rate, putting hands over the abdomen of the subjects, number of breaths per minute were counted and recorded in number. To measure Total Body Weight, standards Weighting Machine was used and score was recorded in kilograms. Weight of body fat was estimated by adding the measurement of Skin-fold thickness taken from selected sites namely Biceps, Triceps, Sub-scapula and Supra-iliac than comparing against the ready reckoner presented by Durnin and Warmerly. Scores were recorded in kilogram. Lean body mass was calculated by subtracting the weight of body fat from Total Body Weight.

Findings:

To determine the significant differences among the three selected groups in the physiological parameters one way analysis of variance statistical techniques were employed, while the F-ratio was found to be significant LSD Post Hoc Test was computed to find out the paired mean difference in the selected variables.

Table – 1

Summary of Analysis Of Variance for the Data on Selected Physiological Parameters of Three Different Age Groups

Variables	Sources of Variance	df	Sum of Square	Mean of Sum of Square	F-ratio
Heart Rate	Between Group	2	1403.49	701.74	46.59*
	Within Group	89	1340.47	15.06	
Respiratory Rate	Between Groups	2	746.50	373.25	100.06*
	Within Groups	89	331.71	3.73	
Vital Capacity	Between Groups	2	18.86	9.43	377.2*
	Within Groups	89	2.26	0.025	
Fat Weight	Between Groups	2	12.18	6.09	60.09*
	Within Groups	89	9.32	0.10	
Lean Body Weight	Between Groups	2	400.93	260.47	32.70*
	Within Groups	89	542.3	6.13	

*Significant at 0.05 level

Tabulated F0.05 (2.89) = 3.10

Table – 1 revealed that there are significant differences in selected Physiological Parameters. As obtained F-ratio of Resting Heart Rate (F = 46.50), Respiratory Rate (F = 100.00), Vital Capacity (F = 377.2), Body Fat Weight (F = 60.09) and Lean Body Weight (32.7) are much higher than the value of 3.10 required for F-ratio to be significant at 0.05 level with (2 and 89) degrees of freedom. Since F-ratio was found significant therefore LSD post-hoc test was applied to test the significant differences between the paired means separately.

Table – 2

Differences between the Paired Means of Heart Rate among the Different Age Groups

8-9 years	10-11 years	12-14 years	Difference of Mean	C.D.
	80.13	73.97	6.13*	2.41
83.3	80.13		3.13*	2.46
83.3		73.97	9.33*	2.41

*Significant Difference at 0.05 level

From the above Table No. 2, it is observed that there are significant differences in Resting Heart Rate between the different age groups. The mean differences have been depicted graphically in figure – 1.

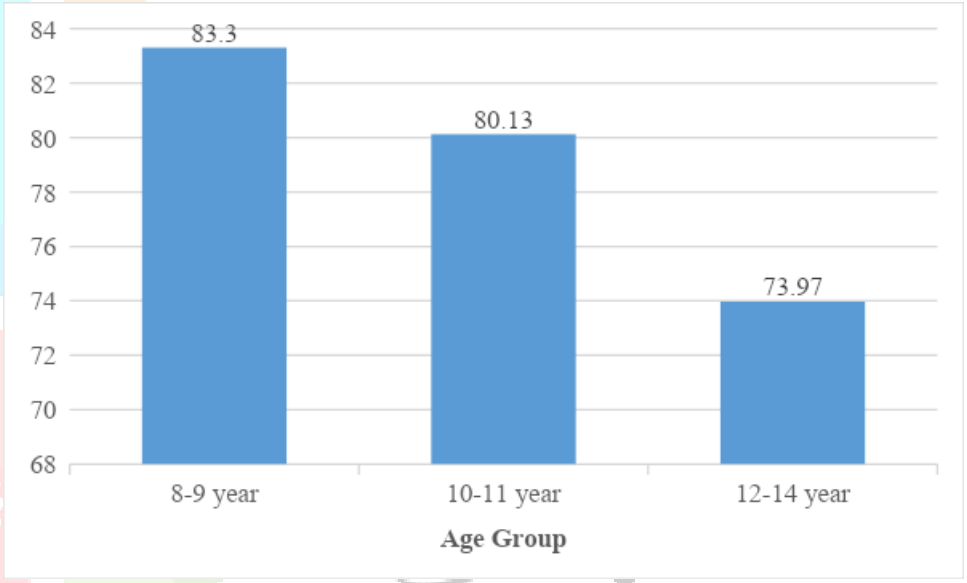

Figure- 1 Differences in the means of Heart Rate among the three groups.

Table – 3

Differences between the Paired Means of Respiratory Rate among the Different Age Groups

8-9 years	10-11 years	12-14 years	Difference of Mean	C.D.
	26.27	21.54	4.73*	1.19
28.26	26.27		1.99*	1.22
28.26		21.54	6.72*	1.19

*Significant Difference at 0.05 level

From the above Table No. 3, it is observed that there are significant differences in Respiratory Rate between the different age groups. The mean differences have been depicted graphically in figure – 2.

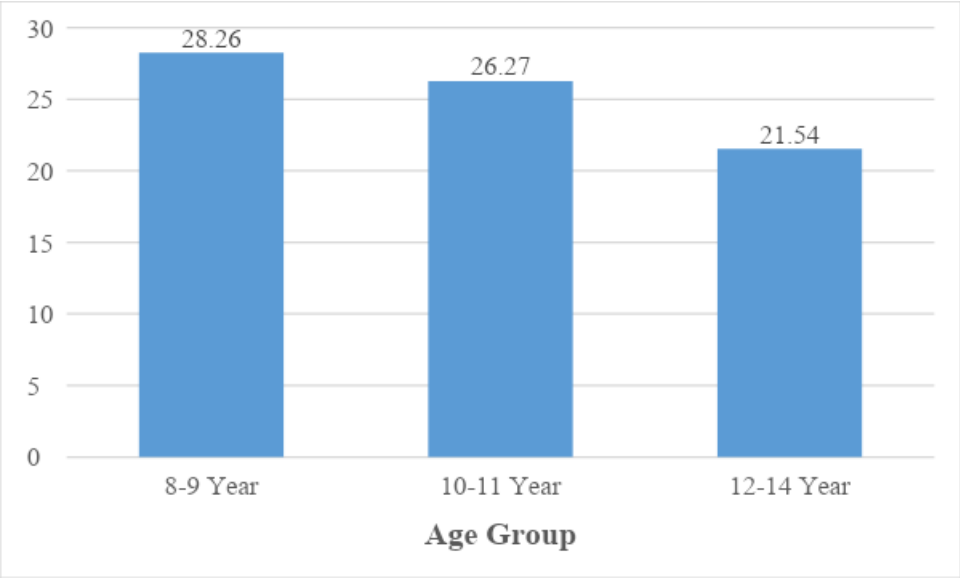

Figure- 2 Differences in the means of Respiratory Rate among the three groups.

Table – 4

Differences between the Paired Means of Vital Capacity among the Different Age Groups

8-9 years	10-11 years	12-14 years	Difference of Mean	C.D.
	1.14	1.70	0.56*	0.0996
0.60	1.14		0.54*	0.101
0.60		1.70	1.10*	0.0996

*Significant Difference at 0.05 level

From the above Table No. 4, it is observed that there are significant differences of Vital Capacity between the different age groups. The mean differences have been depicted graphically in figure – 3.

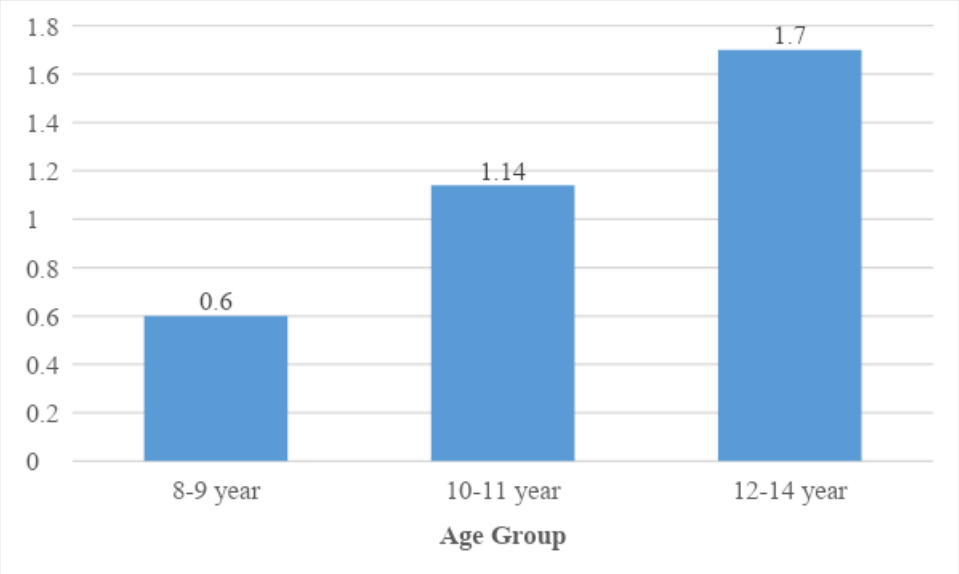

Figure- 3 Differences in the means of Vital Capacity among the three groups.

Table – 5

Differences between the Paired Means of Body Fat Weight among the Different Age Groups

8-9 years	10-11 years	12-14 years	Difference of Mean	C.D.
	2.6	3.39	0.79*	0.19
2.63	2.6		0.03	0.20
2.63		3.39	0.76*	0.19

*Significant Difference at 0.05 level

From the above Table No. 5, it is observed that there are significant differences in Body Fat Weight between the different age groups. The mean differences have been depicted graphically in figure – 4.

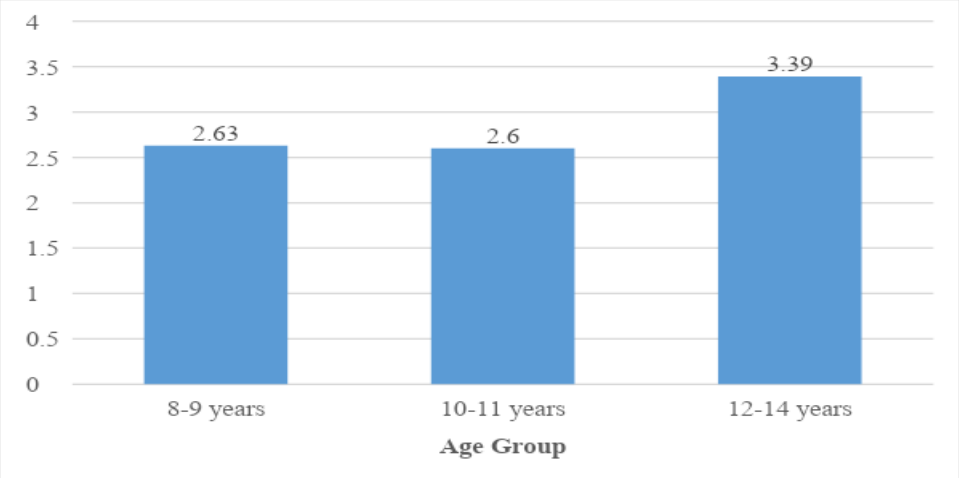

Figure- 4 Differences in the paired means of Body Fat weight among the three groups.

Table – 6

Differences between the Paired Means of Lean Body Weight among the Different Age Groups

8-9 years	10-11 years	12-14 years	Difference of Mean	C.D.
	20.23	25.31	5.08*	1.57
22.5	20.23		2.27*	0.64
22.5		25.31	2.81*	1.57

*Significant Difference at 0.05 level

From the above Table No. 6, it is observed that there are significant differences of Lean Body Weight between the different age groups. The mean differences have been depicted graphically in figure – 5.

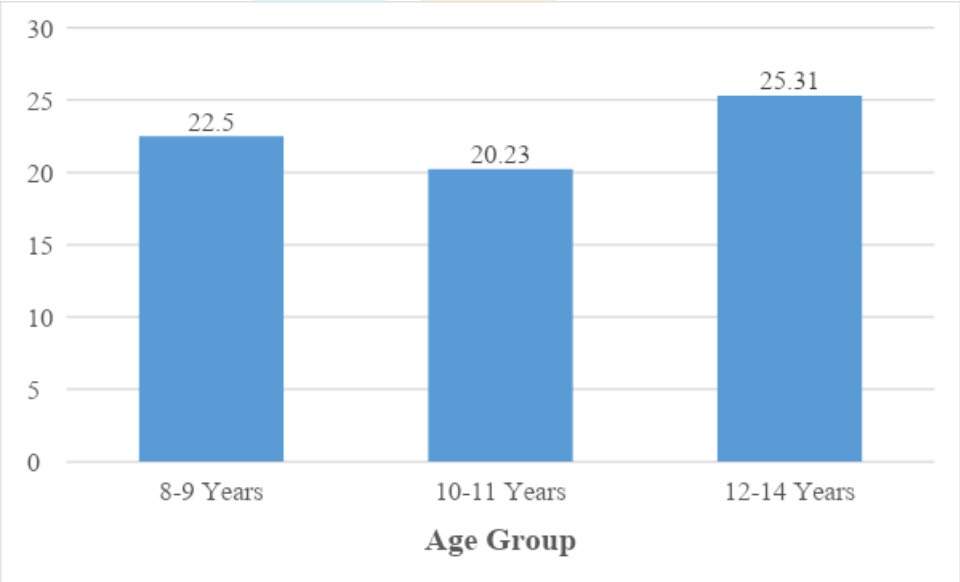

Figure- 5 Differences in the paired means of Lean Body Weight among the three groups.

Discussion

The findings of statistical analysis revealed that there were significant differences in the selected variables of Heart Rate, Respiratory Rate, Vital Capacity, Fat Weight and Lean Body Weight among the three different age group of male students, it may be attributed to the fact that all the selected physiological variables are solely dependent on the size and nature of activities of the individual. Hence these significant differences might have occurred in this study. It is also learnt from the findings that the students belonged to 12 to 14 years of age had showed superiority in the selected variables it may be because the size of Heart, Lungs, as well as strength of the Respiratory muscles and nature of regular activities are quite greater compared to other two selected groups thus significant improvement in the efficiency of the selected physiological parameters have shown by the said group.

Conclusion

Recognizing the limitations of the study and on the basis of statistical findings it may be fairly concluded that the students belong to12 to 14 years of age are quite matured and efficient for performing any physical tasks while compared with the other two groups of students.

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