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ANALYSIS OF MUSCULAR ENDURANCE AMONG ADOLESCENT SCHOOL BOYS OF NORTH-EASTERN STATES OF INDIA

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Abstract: In the present pushbutton era most of the adolescent are not participating in leisure activities and concentrate are on studies. Regular physical activity would be important for life's quality even if it had no relationship to disease and longevity. Physical activity is a significant ingredient in the quality of life, because it increases energy and promotes, physical and mental well being in addition to conferring health benefits. Boys from various schools of [Tripura (TR), Meghalaya (ML), Assam (AS), Mizoram (MZ), Manipur (MN), Nagaland (NL) and Arunachal Pradesh (A.R.)] (N=21000) North-Eastern states of India were selected as subjects at random. Their age ranged from 13 to 15 years (studying from 7^{th} to 10^{th} standard). Muscular endurance was measured by the number of sit-ups in a one minute. The collected data were analyzed by using one-way ANOVA. Among the groups, if any significant difference, scheffe's post hoc test was used to find out the paired mean difference ($P \leq 0.05$). The results of the study show that the adolescent boys of North-Eastern states were differ on muscular endurance. Hence it was concluded that, age, geographical region, growth, social behaviour, food habits and level of physical activity may influence the muscular endurance of adolescent boys.

Keywords: North-Eastern state, Adolescent, Muscular endurance and ANOVA.

INTRODUCTION

Life styles affect people's health with eating habits and regular physical activity being the two most influential factors (Panagiotakos et. al, 2004), irrespective of sex, age or country of residence [1-2]. Current study focuses school going adolescents are facing health hazard problems that leads to physical, physiological and psychological problems. Basic data among adolescent's shows, they are not receiving adequate physical activities and capacity building to equip them for the future. Studies need to conduct in India to high light various areas of concern with respect to adolescent life style.

METHODOLOGY

To achieve this purpose (n= 3000) boys from various schools of each state of Tripura (TR), Meghalaya (ML), Assam (AS), Mizoram (MZ), Manipur (MN), Nagaland (NL) and Arunachal Pradesh (A.R.) N=21000 adolescent boys from North-Eastern states of India were selected as subjects at random. Their age ranged from 13 to 15 years (studying from 7^{th} to 10^{th} standard). Muscular endurance was measured by the number of sit-ups in a one minute. The collected data were analyzed by using one-way ANOVA [3]. Among the group if any significant difference, sceffe's post hoc test used to find out the paired mean difference. The confidence level to test the significance was fixed at 0.05 ($P \leq 0.05$).

RESULT

TABLE - 1

ANOVA of North-Eastern States of Indian on Muscular endurance

Age		Sum of squares	df	Mean square	'F'
13 Years	**B**	7088.131	6	1181.355	36.104*
	W	137197.593	4193	32.721	
14 Years	**B**	7466.433	6	1244.405	28.168*
	W	185238.123	4193	44.178	
15 Years	**B**	23311.742	6	3885.290	102.823*
	W	158438.172	4193	37.786	

P ≤ 0.05 / table value = 2.09/df 6 & 4193

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TABLE-2

AGE	TR vs. ML	TR vs. AS	TR vs. MZ	TR vs. MN	TR vs. NL	TR vs. A.R.	ML vs. AS	ML vs. MZ	ML vs. MN	ML vs. NL	ML vs. A.R.	AS vs. MZ	AS vs. MN	AS vs. NL	AS vs. A.R.	MZ vs. MN	MZ vs. NL	MZ vs. A.R.	MN vs. NL	MN vs. A.R.	NL vs. A.R.	C.I.
13 yrs	3.12*	.64	2.29*	.58	3.40*	.45	2.48*	.83	2.54*	.27	2.67*	1.64*	.06	2.75*	.19	1.70*	1.11*	1.84*	2.56*	.13	2.95*	1.09
14 yrs	3.84*	.60	1.82*	1.30*	1.97*	1.36*	4.44*	2.01*	2.53*	1.86*	2.47*	2.42*	1.90*	2.57*	1.96*	.52	.15	.45	.67	.06	.60	1.27
15 yrs	2.5*	1.09*	4.55*	2.14*	5.2*	5.37*	3.59*	2.04*	.35	2.7*	2.87*	5.64*	3.23*	6.29*	6.47*	2.40*	.65	.82	3.05*	3.23*	.17	1.15

Scheffe's Post hoc test on Muscular endurance for North-Eastern States Adolescent Boys

TR: Tripura, ML: Meghalaya, AS: Assam, MZ: Mizoram, MN: Manipur, NL: Nagaland and A.R.: Arunachal Pradesh.

The result of the study shows that 13, 14 and 15 years adolescent boys of North-Eastern states were significantly differ on muscular endurance. The post hoc test results indicate that,

Out of 21 paired means, 13 paired means are having significant difference on muscular endurance. The results reveal that, NL, ML and MZ boys of 13 years are dominating on muscular endurance then the rest of the North-Eastern state boys.

One third of paired means are not having significant different on muscular endurance. The result of the study indicates that, ML, NL and MZ boys of 14 years are dominating on muscular endurance than the rest of the subjects.

The comparison of 21 paired means shows, except 4 paired means reviewing all other pairs are having significance on muscular endurance. From the result it was concluded that, AR, NL and ML boys of 15 years are showing better muscular endurance than the rest of the population under studied.

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DISCUSION:

Endurance is the ability of an organism to exert itself and remain active for a long period of time, as well as its ability to resist, withstand, recover from, and have immunity to trauma, wounds, or fatigue. In humans, it is usually used in aerobic or anaerobic exercise. The definition of 'long' varies according to the type of exertion – minutes for high intensity anaerobic exercise, hours or days for low intensity aerobic exercise. Training for endurance can have a negative impact on the ability to exert strength (Hickson 1980***)*** unless an individual also undertakes resistance training to counteract this effect [4].

Our muscles are working all day long; they need to be able support resistance for an extended length of time. Throughout most of our day, this resistance is our body weight. By improving our muscular endurance, we not only improve our muscles' capabilities to contend with our daily activities, but we also help our muscles get through longer workouts at the gym. Consult to doctor before beginning any new exercise regimen.

Increasing our muscular endurance will make everyday chores and tasks easier. According to the American College of Sports Medicine, increasing muscular endurance will also limit injuries sustained from physical exertion and from the overuse of active muscles throughout the day.

Muscular endurance goes further than just improving the health of our muscles. Muscular endurance training has beneficial effects on bone and joint health, too. These effects may decrease the risk of osteoporosis and bone fractures.

Muscular endurance will benefit our athletic and recreational activities. Developing muscular endurance will allow performing activities for longer before fatigue sets in. After muscular endurance training, muscles will be able to sustain a load-such as body weight or a back pack – for longer periods, and will do so more efficiently.

Many personnel consider endurance to be an indicator of progress, when strength and cardio training. A person is able to accomplish or withstand a higher amount of effort than their original capabilities means their endurance is increasing expressing improvement. In looking to improve one's endurance they may slowly increase the amount of repetitions or time spent, if higher repetitions are taken rapidly muscle strength improves while less endurance is gained.

Increasing endurance has been proven to release endorphins resulting in a positive mind. The act of gaining endurance through physical activity has been shown to decrease anxiety, depression, and stress, or any chronic disease in total. Although a greater endurance can assist the cardiovascular system it does not imply that any cardiovascular disease can be guaranteed to improve. "The major metabolic consequences of the adaptations of muscle to endurance exercise are a slower utilization of muscle glycogen and blood glucose, a greater reliance on fat oxidation, and less lactate production during exercise of a given intensity."

An age-related decline in muscular strength values was nevertheless apparent. The results fail to reveal a similar age-related trend for muscular endurance, suggesting that swim training influences muscular endurance more than muscular strength among adult women [5].

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The muscular strength and muscular endurance can be improved during the childhood years and favour the prescription of higher repetition–moderate load resistance training programs during the initial adaptation period [6].

The endurance time and pain appearance time are longer in women than in men, particularly at lower contraction levels. In terms of the absolute force are longer in men than in women, particularly at stronger contractions [7].

The endurance time in young men was significantly shorter than in young women. The slopes of the median frequency and mean power frequency in young men were significantly higher than in young women. Age-related changes in the slopes of the median frequency and mean power frequency of erector spine muscle occur in healthy men but not in healthy women [8].

Women generally exhibit greater fatigue resistance than men, due in part to differences in muscle mass. Less muscle mass in women results in decreased oxygen demand and increased oxygen delivery at the same relative workload compared to men and yields greater endurance. The greater fatigue resistance typically observed in females is probably due to differences in muscle mass [9].

The endurance capacity of women is greater than that of men in both isometric and dynamic muscular exercise when the work load is relatively low compared with maximum; at higher forces, there is no difference between the sexes in endurance performance [10].

Mid-exercise and terminal respiratory exchange ratio (R) values are lower in women, suggesting a later occurrence of muscle glycogen depletion as a factor in their enhanced endurance [11]. From the result of the study it is clear that, when age advances the muscular endurance also increased during adolescent years. Among the states NL and MZ state boys of 13, 14 and 15 years are having better muscular endurance than the rest of North- Eastern states.

CONCLUTION

1. Muscular endurance is directly proportional to the age of adolescent periods.
2. Among the states NL, ML and MZ boys of 13 years, ML, NL and MZ boys of 14 years and A.R., NL and MZ boys of 15 years shows better Muscular endurance.
3. The life style, food habits, curriculum design and health awareness of NL and MZ States adolescent boys were better than the rest of the North-Eastern states.

IMPLICATION:

Health awareness will be reformed among the adolescent school boys of North-Eastern states of India. Further the state government and school education department will take necessary steps to improve health related fitness of the adolescent boys introducing physical education compulsory programme.

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