



A study of muscular endurance among school boys of central development region of Nepal

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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 wellbeing in addition to conferring health benefits. Boys from various schools of Kathmandu (KTM), Kavrepalanchok (KVR), Nuwakot (NWT), Chitwan (CTN), Makawanpur (MKP), Sarlahi (SLH) and Dolakha(DLK)] (N=21000) Central development region's districts of Nepal were selected as subjects at random. Their age ranged from 13 to 15 years (studying from 7th to 10th class). 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 Central development regions were differ on muscular endurance. Hence it was concluded that, age, geographical region, growth, social behavior, food habits and level of physical activity may influence the muscular endurance of adolescent boys.

Keywords: central development region, 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) ^[1], irrespective of sex, age or country of residence (Yusuf *et al*, 2004) ^[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 Nepal to high light various areas of concern with respect to adolescent life style (Sidra 2009) ^[3].

Methodology

To achieve this purpose boys from various schools of Central Development Region i.e. Kathmandu (KTM), Kavrepalanchok (KVR), Nuwakot (NWT), Chitwan (CTN), Makawanpur (MKP), Sarlahi (SLH) and Dolakha (DLK) N=21000 adolescent boys from Nepal were selected as subjects at

random. Their age ranged from 13 to 15 years (studying from 7th to 10th class). 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 group if any significant difference, scefte'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 Central Development Region of Nepal 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	

Table 2

AGE	KTM Vs KVR	KTM Vs NKT	KTM Vs CTN	KTM Vs MKP	KTM Vs SLI	KTM Vs DLK	KVR Vs NKT	KVR Vs CTN	KVR Vs MKP	KVR Vs SLI	KVR Vs DLK	NKT Vs CTN	NKT Vs MKP	NKT Vs SLI	NKT Vs DLK	CTN Vs MKP	CTN Vs SLI	CTN Vs DLK	MKP Vs SLI	MKP Vs DLK	SLI Vs DLK	CL
13 yrs	3.12*	.64	2.29*	.58	3.40*	.45	2.48*	.83	2.54*	.27	2.67*	1.64*	.06	2.75*	2.75*	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	.06	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 central development region adolescent boys

KTM: Kathmandu, KVR: Kavrepalanchok, NWT: Nuwakot, CTN: Chitwan, MKP: Makawanpur, SLI: Sarlahi and DLK:

Dolakha. The result of the study shows that 13, 14 and 15 years adolescent boys of Central Development Region 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, SLI, KVR and CTN boys of 13 years are dominating on muscular endurance then the rest of the boys. One third of paired means are not having significant different on muscular endurance. The result of the study indicates that, KVR, SLI and CTN 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, DLK, SLI and KVR boys of 15 years are showing better muscular endurance than the rest of the population under studied.

Discussion

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) ^[6] unless an individual also undertakes resistance training to counteract this effect. 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 (<http://www.livestrong.com/article/331420-why-is-muscle-endurance-important>). 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 (<http://physicalactivityline.com/index.php>). 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

(<http://livroseducacaofisica.br.tripod.com>). Although a greater endurance can assist the cardiovascular system it does not imply that any cardiovascular disease can be guaranteed to improve (<http://livroseducacaofisica.br.tripod.com>). "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 (Gail Dummer 2013) ^[11]. 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 (Avery Faigenbaum 1999) ^[12]. 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 (Sato & Ohashi 1989) ^[13]. 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 (Hiroyuki Tsuboi 2013) ^[14]. 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 (Gore & Sally 2007) ^[15]. 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 (Maughan 1986) ^[16]. 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 (Froberg 1984) ^[17]. From the result of the study it is clear that, when age advances the muscular endurance also increased during adolescent years. Among the states SLI and CTN state boys of 13, 14 and 15 years are having better muscular endurance than the rest of North- Eastern states.

Conclusion

Muscular endurance is directly proportional to the age of adolescent periods. Among the states SLI, KVR and CTN boys of 13 years, KVR, SLI and CTN boys of 14 years and DLK., SLI and CTN boys of 15 years shows better Muscular endurance. The life style, food habits, curriculum design and health awareness of SLI and CTN 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 Central Development Region of Nepal. Further the government and school education department will take necessary steps to improve health related fitness of the adolescent boys introducing physical education compulsory programmer.

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