

Association of physical activity levels with physical fitness parameters among the Children of Age 11-12 Years

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Abstract

The study was intended to examine the relationship of physical activity levels with selected physical parameters viz. power, speed, legs explosive power, handgrip strength, upper body strength, abdominal strength and flexibility among the school children of age 11-12 years. A sample of 60 male children was selected using purposive sampling technique. Data was collected by administering physical fitness tests and a self-reported questionnaire was used to assess physical activity levels. Data was analyzed by employing bivariate correlation, putting alpha level at 0.05. It was found that physical activity levels has significant relationship with power, speed, leg's explosive strength, endurance, upper body strength and abdominal strength ($p < 0.05$).

Keywords: physical activity levels, physical fitness, correlation

Introduction

The terms "physical activity," "physical exercise," and "physical fitness" are often mixed up and used interchangeably. Though these are narrowly allied, using these as substitutes to each other is a wrongful practice. "Physical activity" refers to any bodily movement produced by skeletal muscle which requires consumption of energy. "Physical exercise," conversely, can be interpreted as any strategic, organized, and systematic physical activity planned to enhance or conserve one or more components of physical fitness. "Physical fitness" may be defined as an extent of the capability to perform physical activity or physical exercise that assimilates the majority of the bodily functions involved in bodily movement (Caspersen *et al.*, 1985) ^[1].

Physical inactivity has its linkage with a number of health concerns such as cancer, type 2 diabetes, chronic illness, osteoporosis, coronary diseases, asthma, obesity, mental disorders, premature mortality and morbidity etc. (Knight, 2012) ^[2]. Cardiovascular diseases account for 32% of all global deaths (Roth *et al.*, 2015) ^[3]. The previous studies have argued that cardiovascular diseases have its roots in childhood and adolescence. It is very likely that Lipid and lipoprotein profiles, blood pressure, and fatness in young people tend to persevere over their lifespans (Ortega *et al.*, 2007) ^[4]. Moreover, it is evident that behavioral practices of physical activity such as personality type in juvenile are sustained throughout maturity (Twisk *et al.*, 2000; Singh *et al.*, 2017) ^[5].

^[6]. Hence, young age is crucial for the primary avoidance of cardiovascular disease and other disorders linked with a sedentary living. This is particularly true when we take into account the difficulty involved in modifying adult lifestyles.

Studies have suggested that physical activity and physical fitness are strongly associated (Livingstone, 1994) ^[7]. A study by Bénéfice (1998) ^[8] established the fact that boys owning superior indices of body composition, strength and cardiorespiratory fitness in girls were directly related with a higher level of physical activity. Moreover, gross and perceptual motor skills deficiencies in children are reported to be associated to physical inactivity (Cairney *et al.*, 2005; Cloete, Pienaar, & Coetzee, 2006; Prinsloo & Pienaar, 2003; Skinner & Piek, 2001; Sääkslahti *et al.*, 1999) ^[9, 10, 11, 12, 13]. In Indian context, the data regarding the linkage between physical activity and physical fitness is scarce (Singh & Singh, 2017) ^[6], therefore this study is an attempt to initiate research on these noteworthy parameters.

Methods and Materials

To fulfill the purpose, the purposive sampling method was used and a total of 60 male children were selected from the various schools of Amritsar, Punjab, India. The mean and standard deviation of age was 11.27 ± 0.44 . The two-tailed relationship was assessed between the physical activity levels and some selected physical fitness parameters. The tests for each variable are given in table 1.

Table 1: Description of variables, tests and measuring units.

Variable	Test	Measuring unit
Speed	30 meter flying start	Seconds
Legs explosive power	Standing broad jump	Centimeters
Endurance	800 meter run and walk	Minutes
Left hand grip strength	Hand Dynamometer	Kilograms
Right hand grip strength	Hand Dynamometer	Kilograms
Upper body strength	Chin ups	Maximum counts
Abdominal strength	Sit ups	Maximum counts
Flexibility	Forward bend and reach test	Centimeters
Physical activity level	Physical Activity Questionnaire – Children	5-point scale

Statistical analysis

To assess the relationship between physical activity levels and physical fitness parameters, bivariate correlation analysis was run. Alpha level was put at 0.05 level.

Results

Table 2: Correlations between physical activity levels and selected physical fitness parameters.

Variable	Physical Activity level	
	r	p-value
Power	0.412	0.001*
Speed	-0.260	0.045*
Leg's explosive strength	0.447	0.001*
Endurance	-0.392	0.002*
Left hand grip strength	-0.107	0.417
Right hand grip strength	-0.045	0.735
Upper body strength	0.302	0.019*
Abdominal strength	0.318	0.013*
Flexibility	-0.74	0.572

*Significant at 0.05 level

Table 2 depicts the correlation between selected physical fitness variables and physical activity levels among the school children. Findings revealed significant positive correlation between physical activity levels and power ($r=0.412$, $p=0.001$), leg's explosive strength ($r=0.447$, $p=0.045$), upper body strength ($r=0.302$, $p=0.019$) and abdominal strength ($r=0.318$, $p=0.013$). Meanwhile, significant negative correlations were noticed between physical activity levels and speed ($r=-0.260$, $p=0.045$) and endurance ($r=-0.392$, $p=0.002$). On the other hand, insignificant correlations were depicted between physical activity levels and handgrip strength and flexibility.

Discussion

The study was aimed to examine the relationship of physical activity levels with selected physical fitness parameters viz. power, speed, legs explosive power, handgrip strength, upper body strength, abdominal strength and flexibility. It was found that the parameters: power, leg's explosive strength, upper body strength and abdominal strength has significant positive relationship with physical activity levels. These findings are in conformity with the results of similar studies (Leblanc *et al.*, 2015; Kostick, 2016) [15, 21]. However, our study shows inconsistency to the former study with regard to the variable handgrip strength that did not appear as a significant correlate of physical activity levels. These discrepancies might be

occurred due to that Leblanc *et al.* (2015) [15] studied the adult sample whereas we included children of 11-12 years in our study. In the meantime, the scores of physical activity levels were negatively correlated with the scores of speed and endurance. These findings imply a direct relationship between aforementioned variables as less timings in speed and endurance test mean better performance. These results are in line with the conclusions of other analogous studies (Laudani *et al.*, 2013; Nokes, 2009; Puthoff *et al.*, 2008; Morie *et al.*, 2010) [16, 17, 18, 19]. Another study presented similar results that found strong evidences of association between physical activity and cardio-respiratory endurance (Oja, 2001) [20]. Furthermore, our study revealed an unanticipated finding that flexibility was not associated with physical activity levels. These findings are inconsistent with the studies of Gu *et al.* (2016) and Kostick (2016) [21].

Conclusions

On the basis of findings, the present study inferred a strong inter-relationship between physical activity levels and some selected physical fitness parameters.

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