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Association of physical performance with academic achievement emotional intelligence and educational stress in female adolescents

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Abstract

Regular participating in physical activity, sports and such allied activities has innumerable benefits during adolescents. Leisure time pursuits should be physically demanding and mentally soothing. Adolescence is important stage of life wherein an individual's personality gets shaped. The child tries too hard to prove itself in the competitive world. Emotions are quite common and maintaining stability is of utmost importance. The emotions cannot be expressed at will of an individual. An adolescent is burdened with huge amount of educational stress. Peer pressure, teacher pressure and parental pressure all together places terrific demands to achieve in studies during adolescence. Physical performance is naturally high in those adolescents who are physically active. This paper is an attempt to explore the influence of physical performance on academic achievement, emotional intelligence and educational stress. To achieve the purpose of the study necessary data was collected from 635 subjects of high schools in Karnataka during 2016-17. Handgrip strength was used for assessing physical performance and various standardized questionnaires were used to assess emotional intelligence and educational stress. A knowledge test was duly constructed for assessing academic achievement. Apart from descriptive statistics Pearson product moment correlation coefficient was calculated using SPSS. The findings are discussed in detail. On the basis of the results of the present study it has been concluded that there was significantly weak linear relationship of handgrip strength with academic achievement (positively) and educational stress (negatively) in adolescent girls of Karnataka.

Keywords: adolescent, physical performance, hand grip strength, emotions, stress, academics

Introduction

Regular participating in physical activity, sports and such allied activities has innumerable benefits during adolescents. Leisure time pursuits should be physically demanding and mentally soothing. The academic pressure places tremendous demand on the adolescents. To cope with such stresses, being physically active is very important. Physically active child demonstrates higher physical, mental and emotional effectiveness as compared to its inactive counterpart (Ruiz, *et al.*, (2010) ^[1]).

Adolescence is important stage of life wherein an individual's personality gets shaped. The child tries too hard to prove itself in the competitive world. Academic achievement is the first priority during this period. The child engages considerably in academic pursuits at the cost of being physically active. A strong positive correlation between academic achievement and physical performance is repeatedly established among almost all population (Kundu and Tutoo, 2004) ^[2].

Emotions are quite common and maintaining stability is of utmost importance. The emotions cannot be expressed at will of an individual. Timely expression of emotions is detrimental for achieving success in life. Adolescence is a stage filled with fluctuation in emotions. Frequent outburst of emotions can be dangerous in certain circumstances. Emotional intelligence is most essential during this period. Dealing with outside world needs lot of temperament and emotional stability. An individual is usually judged by the way of emotional expression. Experiences in sports and allied activities give ample opportunity to stabilise personality. There are plenty of channels to exhibit emotions and gain control over them in sports (Fazadkhodamoradi, *et al.*, (2015) ^[3]

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An adolescent is burdened with huge amount of educational stress. Peer pressure, teacher pressure and parental pressure all together places terrific demands to achieve in studies during adolescence. Physical activities and sports play active role in clearing the blockage created by academic stress. A child gains relief during such pursuits in the ground. The linkage between educational stress and physical performance is well established in the field of research on adolescents (Kumar and Talwar, 2014) [4].

Physical performance is naturally high in those adolescents who are physically active. The child engaged in leisure time pursuits like sports, games, dance and martial arts etc tend to exhibit higher levels of physical performance capacities. Hand grip strength is an ideal way to assess physical performance in adolescents. Although there are plenty of tests to determine physical performance hand grip strength testing is widely used because of its feasibility and economy. Female adolescents are highly benefited due to physical activity participation as compared to their male counterparts. Social inhibitions and other conventionalities keep them reserved in Indian society. This paper is an attempt to explore the influence of physical performance on academic achievement, emotional intelligence and educational stress.

2. Materials and methods

2.1 Selection of subjects

To achieve the purpose of the study necessary data was collected from 635 subjects of high schools in Karnataka during 2016-17. The subjects selected from various schools of Bengaluru and Mysuru divisions were studying in 9th standard and their age ranged between 14 to 16 years.

2.2 Selection of test items

Dominant hand grip strength was used for assessing physical performance among school students. Grip strength was measured by the help of an analogue hand grip dynamometer. Before taking the measurement, the subjects were requested

to sit in a comfortable position. They were asked to squeeze the dynamometer as hard as possible without moving the body. Thus, the final grip strength was measured for both hands and the reading was taken from the dynamometer scale when the pointer no longer moved. Three trials were given to each subject and the best reading was the score of the subjects.

The investigator constructed a knowledge test for assessment of academic achievement in adolescent students. The test included 50 questions from General Science (N=17), Social Science (N=16) and Mathematics (N=17) subjects of eighth standard. The duly constructed test was standardized using Item Analysis and Item Discrimination procedures.

In order to assess the academic stress of adolescents, Educational Stress Scale for Adolescent (ESSA) developed by Sun, Dunne, Hou and Xu (2010) comprised of 16 questions using 5-point scale from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating greater stress.

The study included 33-item Emotional Intelligence Scale (Schutte *et al.*, 1998) comprised of six factors where items are rated on a 5-point scale anchored by 1=strongly agree to 5=strongly disagree. The model of emotional intelligence of Salovey and Mayer (1990) provided the conceptual foundation for the items used in the scale.

2.3 Procedure

The investigator personally visited various schools of Karnataka state and collected data. The questionnaires and hand grip strengths were conducted in the class room setting. Apart from descriptive statistics Pearson product moment correlation coefficient was calculated using SPSS.

Results & Discussion

The descriptive statistics on handgrip strength, academic achievement, emotional intelligence and educational stress of adolescent girls is given in table 1.

Table 1: Results on handgrip strength, academic achievement, emotional intelligence and educational stress of adolescent girls

	Rural (N=274)	Urban (N=323)	Kannada Medium	English Medium	Overall
Handgrip strength	21.93±4.27	21.26±4.37	21.60±4.22	21.53±4.53	21.57±4.33
Academic Achievement	22.93±4.69	23.91±5.81	23.33±4.75	23.65±6.22	23.44±5.33
Emotional Intelligence	120.63±13.66	118.54±18.63	120.93±13.85	117.06±20.13	119.51±16.51
Educational Stress	47.65±10.26	48.06±10.58	48.04±9.85	47.55±11.38	47.87±10.42

Table 1 on handgrip strength, academic achievement, emotional intelligence and educational stress of adolescent girls makes it clear that the results are normally distributed with acceptable homogeneity. Results on relationship between

physical performance, academic achievement, emotional intelligence and educational stress of adolescent girls are provided in table 2.

Table 2: Summary of Pearson product moment correlation coefficient regarding relationship between handgrip strength, academic achievement, emotional intelligence and educational stress of adolescent girls

		Handgrip strength	Academic Achievement	Emotional Intelligence	Educational Stress
Rural	Handgrip strength	Pearson Correlation	1	.087	-.129 [*]
		Sig. (2-tailed)		.134	.026
		N	297	297	297
Urban	Handgrip strength	Pearson Correlation	1	.144 ^{**}	-.133 [*]
		Sig. (2-tailed)		.008	.237
		N	338	338	338
Kannada	Handgrip strength	Pearson Correlation	1	.001	-.147 ^{**}
		Sig. (2-tailed)		.978	.817
		N	403	403	403
English	Handgrip strength	Pearson Correlation	1	.251 ^{**}	-.112
		Sig. (2-tailed)		.000	.011
		N	232	232	232
Overall	Handgrip strength	Pearson Correlation	1	.112 ^{**}	-.132 ^{**}
		Sig. (2-tailed)		.005	.069
		N	635	635	635

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

From table 2 it is evident that there is weak negative linear relationship between handgrip strength and educational stress (-0.129) in rural girls; weak positive linear relationship between handgrip strength and academic achievement (0.144) and negative linear relationship between handgrip strength and educational stress (-0.133) in urban girls; weak negative linear relationship between handgrip strength and educational stress (-0.147) in Kannada medium girls; weak positive linear relationship between handgrip strength and academic achievement (0.251) and weak positive linear relationship between handgrip strength and emotional intelligence (0.166) in English medium girls; and weak positive linear relationship between handgrip strength and academic achievement (0.112) and weak negative linear relationship between handgrip strength and educational stress (-0.132) in adolescent girls of Karnataka.

It has been observed that the rural girls demonstrate lesser stress as they possess higher grip strength. The girls who engage in physical activities and sports in rural setting for keeping themselves fit can considerably reduce their stress levels. In urban setting a significant positive correlation was observed between hand grip strength and academic achievement. The results make it clear that the girls who engage in physical activities can score higher grades in academic endeavors. Further a negative relationship was also observed between hand grip strength and educational stress. This means that the urban girls can reduce their lifestyle related stresses by engaging in physical activities. Kannada medium girls tend to have less education related stress as their hand grip strength enhanced. As we know under privileged and un privileged girls now a days attend Kannada medium schools. In such girls, stress to achieve academically is a prominent issue. Being physically active can be considered as a remedy to overcome ill effects of stress. English medium girls are immensely benefitted by keeping themselves physically fit. Hand grip strength showed significant association with academic achievement and emotional intelligence in English medium girls. These girls are over protected and get very less opportunity to involve in physical activities and sports. Overall it was observed that the physical performance measured in terms of hand grip strength has significantly positive relationship with academic achievement and educational stress. This means that the girls are benefitted from physical activities and sports in order to gain higher academic scores and reduce education related stress.

There was a significant difference in grip strength as a trend for boys to be stronger than girls in all age groups between 4 and 15 years in a study by Ploegmakers, *et al.* (2013) ^[5]. Fitness was strongly and significantly related to academic performance in another study on associations of physical fitness and academic performance among school children (Van Dusen, *et al.* 2011) ^[6]. Study by So (2012) ^[7] concluded that moderate physical activity was positively correlated with academic performance in both boys and girls. The female students who did not participate in regular physical activity showed higher OR values in the perception of stress and lower odds ratio values in the self-rated health variable compared to participants in regular physical activity (Kwon, Oh and Yang, 2016) ^[8]. According to Li, Lu and Wang (2009) ^[9] participation in PA might be an effective way to improve the physical, psychological, as well as emotional health of college students.

Conclusions

On the basis of the results of the present study it has been

concluded that there was significantly weak linear relationship of handgrip strength with academic achievement (positively) and educational stress (negatively) in adolescent girls of Karnataka.

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