RESEARCH REPORT

DETERMINE THE RELATIONSHIP BETWEEN LOW (LIGHT) PHYSICAL ACTIVITY AND ACADEMIC PERFORMANCE IN UNIVERSITY STUDENTS

ABSTRACT

BACKGROUND
Sedentary lifestyle has widely increased in people of all ages; in present era due to vast development in science and technology, mostly students prefer indoor activities which negatively influences their health. Sedentary lifestyle is not only a risk factor for non-communicable diseases but it also causes several mental and psychological disorders which negatively affect the academic performance of students.

PURPOSE
To determine the relationship between light physical activity and academic performance in university students

STUDY DESIGN AND SAMPLE SIZE
Observational study and it consists of 178 participants.

METHOD
Closed ended Questionnaires were distributed among all participants, then the data was entered in SPSS 16 software and results were analyzed

RESULTS
Pearson Chi- Square test was applied to determine the co-relation between physical activity and academic performance. Correlation between light physical activity and academic performance showed non-significant results (p =0.39).

CONCLUSION
Correlation found between both variables was non-significant. However, physical activity has various helpful effects on mood and other fatal diseases.

Keywords
Physical Activity, Academic Performance, CGPA, University going students, Sedentary Lifestyle, Exercise, Age.

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INTRODUCTION

Physical activity is defined as any movement performed by skeletal muscles that require energy[1]. Physical inactivity is the 4th leading mortality risk factor that accounts for 3.2 million deaths worldwide[1]. Academics are related to education[2] whereas achievement is something which is accomplished or have been done through hard work; accomplishment is something that is expressed as a condition keeping in mind the end goal to fulfill something[2].

Physical activity and sports are commonly promoted for their constructive effect on children physical health. Furthermore, strenuous exercise among adolescence results in a decline in cardiovascular risk. Moreover, it is also suggested that physical activity has valuable psychological effects on well-being, including health-related quality of life and improved mood states[3]. It is remarkably believed that by involving in regular physical activity, cognition level and brain function has been improved, which is associated with positive physical and psychological health[4]. According to Sharon book of fitness and wellness, people having sedentary lifestyle, walk less than 5000 steps in a single day whereas low physical active people are those who take 5000-7499 steps per day [5].

Physically active and fit Individuals have a tendency to perform better in academic examinations[6]. Continuous assessment or examinations are the tools commonly used to measure academic achievements[7]. The accessible confirmation demonstrates that youngsters who are physically active and fit have a tendency to execute better in classroom so giving time to physical activity does not negatively impact their grades in examinations[6].

We believe that light physically active students are more active academically and perform better than students with sedentary life style. Furthermore, improved cerebellar functions, energy levels, understanding, self-worth, and actions have been attributed to physical activity hence it improves academic performance[8]. Physical activity and academic performance shows a constructive relationship with each other[8]. Whereas, the perception about non-academic activities is that it has negative impact on academic performance[9].

Physical education and other physical activity programs are significantly important in secular education as budgetary constrained physical education program had been neglected[6]. Today's most prevailing issue about health in our children is obesity[6]. Approximately 25 million children are obese and have low physical activity level which is a contributing factor to the epidemic that accounts for more than one third of kids and adolescence[6]. Children who have sedentary or inactive life style during childhood are at greater risk for developing obesity and cardiovascular diseases in adulthood[9]. Physical inactivity is an important element which leads obesity in population. Stationary position for long time, for example, continuously watching television, PC use, playing computer games and cell phone usage have to be discouraged[10]. However, there are some studies addressing this issue that either physical activity have effect or not and these studies have mixed results[9]. Furthermore, in some cases there is a total decline in school based physical activity program worldwide and time for physical education has been decreased in some educational institutions[6].

Academic performance is never affected by daily physical education. Moreover, children perform better in class rooms that are physically active[6]. Moreover through physical education, outstanding learning environment can be provided in school which leads to the improvement in health of the children[6]. At least, an hour of moderate physical activities is being prescribed by most specialists, almost five days in a week for physical action, but only 3.8% of elementary schools provide daily physical activity education that is very disappointing which results in the lack of physical activity among children[6].

In kids, there is a positive association between physical activity and cognitive performance[11]. Improved mind function in addition to its nourishment, higher strength, absorption level, changes in body build, increased confidence and better behavior, and these all leads to improvement in cognitive level in youth that are giving extra time to physical activity[8]. Regular Physical activity enhance brain functions, likewise, it increases blood flow to cerebral cortex, which results in greater nutrient intake, greater arousal and change in hormonal levels in the body[12].

Similarly associated neuro-hormonal balance which all leads to the improvement in nutritional status and promotes the growth of inter neuronal connection. All these significant improvements are achieved by regular physical activity[13]. Whereas, there is no positive or negative relation found between physical activity and academic achievement in a study[6].

Fit and healthy students perform higher on attention tasks which involve higher cognitive power, it includes goal oriented, self-regulatory process which includes preparation, organization, abstract problem solving, running memory, motor control and inhibitory control[14]. Physiological mechanisms have proposed the relationship between physical movement, and wellness.[1] Physical Activity may enhance cerebral blood flow which increases the supply of nutrients such as glucose and oxygen to the cerebrum[2]. Both acute as well as chronic exercise may influence neurotransmitter levels

along with potential effects on memory and psychosomatic state[3]. Physical Activity may promote angiogenesis in the cerebral cortex[15].

Higher scholastic accomplishment was identified most significantly in those individuals, who are more physically active and have higher levels of wellness[8]. On several test scores[6], students who spent more time in physical activity performed better than those students who spent less time in physical activity. One more study[8] showed that physical wellness has more remarkable effect on the test score of science than in reading. Also, they found that females who have higher wellness level exhibited higher scholastic accomplishment than males. In few studies[6] positive relationship was found among physical action support and scholastic execution. However, none of these studies surveyed scholarly execution with institutionalized instructive test.

In 2001, more than 200 students of sixth grade were included in a study, in which the results showed that there were no differences of standardized test score existed among the physically active and physically inactive students[16]. Similarly, in a study conducted on primary school students, same results were found.

In South Eastern Massachusetts, students receiving more than 56 hours of physical education during their school per year showed significant increase in standardized test scores of English and language arts as compared to students who are receiving only 28 hours of physical activity during school year.[6] The advantages of physical activity are recognized, however, in state funded schools physical training is seen as an extracurricular movement and physical training instructors have encountered many problem at the time when school budget is less or when there is more time required for the studies to enhance test scores than physical training is one of the first thing to be excluded or compromised[17].

On the other hand, it proved that physical training has an immediate beneficial outcome on critical instructive areas, for example, reading and arithmetic, it should be accepted that physical training is not extracurricular; maybe, it is a basic segment in the scholarly achievement of understudies[17]. Furthermore, in United States the data was obtained from almost twelve thousand adolescents to check the correlation between physical teaching or learning and academic performance, their report showed that adolescence who take part in school based physical activity such as physical learning, group activities or sports performance with their parents, achieved 20% more Score in Math's or English than their sedentary mates[6].

Leslee J. et al concluded that improved level of brain activity, perception, body weight, self-esteem, behavioral improvement and improved energy level are thought to have motivated effects towards physical activity. Hence, it leads to improved academic performance[8]. Social and moral enhancement as well as academic performance of children is significantly improved by the physical activity[16]. However, huge increment in the scores of arithmetic and perusing among those understudies who were enlisted in physical movement for 70 or more minutes[10].

For improvement of academic achievement scores, we must have to add physical active educational lessons which should be cost effective, and does not require extra teacher training time. Furthermore, this must be an enjoyable experience for the teachers as well as for the students[18]. Youth must have to take part regularly even for an an hour in moderate and lively physical activities[10].

The correlation between physical activity, academic success, and fitness provides a unique opportunity for improvement of health and academic performance by the physical activity programs[18]. Moreover, the relationship between activity level and cognition performance including perceptual skills, brainpower proportion, academic performance, oral tests, math's tests, developmental level and academics willingness in school going children (aged 4-18 years) are found positive, students who are involved in strenuous outdoor physical activity had drastically better grades than those who were not involved in strenuous activity[9]. Likewise, it was also found that large amount of physical activity enhances academic achievement in kids and youngsters[6]. There is significant improvement in self-esteem in those who took part in physical activity[19]. The correlation among activity level, cognition and school performance is being supported by many literature[18]. Cognitive ability and school performance in children have appeared to be associated with both fitness and the level of body fats[20, 21]. Lower academic achievements was related with higher body mass index[22]. Shepherd has proposed that prolonged physical activity in the middle of the school day may stimulate excitement and diminish fatigue, which can promote prolong focus during classes[13]. Significant relationships were found among school performance and both activeness and involvement in sports[17]. The components by which understudies might enhance scholastic accomplishment includes expanded physical action through physical instructions, level of and decreased fatigue, which may rapidly lengthen consideration, scope and fixation[17]. Longitudinal evaluation of physical tutoring classes, physical action support, and scholastic accomplishment may give more furnished data of their actual connections[23-25]. Their examination was aimed to evaluate the effect of physical training, class enlistment and wide-ranging physical movement on academic completion in center school youngsters

through the span of a scholarly year[17]. Students selected in physical training would have increased academic accomplishment over those not enlisted in physical training due to prolonged duration of physical activity among class time[17].

However, looking for the link between academic performance and physical activity is the concerned problem and more studies are needed on this subject. Another most important considerable component which is still unresolved is the connection of physical activity and academic achievement with age or gender[16]. There is a decline in self-esteem, especially in females during adolescence but it is also evident that involving in physical activity; particularity vigorous activities are helpful for some youth to negotiate this difficult period[19].

Another report concluded that there exists fruitful correlation between academic performance and physical activity as mentioned in National Representative Sample of Australian School children aged between 7-15 years[16]. It concluded that physical activity has potential to improve health and obesity which directly impacts on the academic performance of students[18].

METHODOLOGY

Population and Study Sample
Physiotherapy students (18-25 years) who were enrolled in DPT (Doctor of Physical Therapy) at Ziauddin College of Physical Therapy were involved in our study population.

Sample Size and Selection of Sample
Sample size: 178
Sample was selected randomly on the basis of inclusion criteria.

Study Design
Observational study

Sampling Technique
Probability sampling (Simple Random Sampling)

Study Setting
The study was conducted at Ziauddin College of Physical Therapy North Nazimabad, Karachi, Pakistan

Inclusion Criteria
Students enrolled in DPT program aged between 18-25 years.
Both genders (Male and Female)

Exclusion Criteria
Students aged more than 25 years or less than 18 years.
Students with reading and writing disability
Students with any physical disability
Students with any neurological deficit

Variables of Study
Age, gender, year of study, Cumulative grade point average (CGPA), physical activity level, academic performance

Collection of Data
Data was collected through questionnaire which comprised of 13 questions, based on daily physical activities and academic performance of the participating students.

After collecting the data from questionnaire, the data was analyzed to check the correlation of academic performance with physical activity in order to find the relationship between them.

Ethical Considerations
The Research is approved by the Ethical Committee of Ziauddin University. Participant's demographic information was kept confidential and is only accessed by the authorized personal.

RESULT

The primary objective of the study was to find the effect of light physical activity on academic performance in university students;

Effect of physical activity level on academic performance
Value of p is 0.42 which shows non-significant effect of light physical activity on academic performance. Analysis of the data shows that there is no significant relationship among physical activity level and students performance. Cross tabulation shows, out of 178 samples, 65 participants have sedentary life style. CGPA of these participants (table.1) are as, one participant has CGPA <2.0, 13 participants have CGPA between 2.0-2.4, 19 participants have CGPA between 2.5-2.9, whereas 26 participants have their CGPA between 3.0-3.5 and the remaining 6 participants have their CGPA >3.5 as shown in Fig.1. 30 participants are lightly active, CGPA of these participants are as follows, 8 participants have CGPA between 2.0-2.4, 10 participants have between CGPA 2.5-2.9, 9 participants have between 3.0-3.5 and only 3 participants have their CGPA >3.5,

In the somewhat active category there were 25 students, CGPA of these students are: 10 participants have their CGPA lie between 2.5-2.9, 8 participants have between 3.0-3.5, 4 participants have CGPA >3.5, only 2 participants (8%) have 2.0-2.4 whereas only 1 participant have CGPA <2.0

23 participants, are active in nature, academic performances of these students were: 10 participants have CGPA between 2.5-2.9, 5 participants have 3.0-3.5, 3 participants have >3.5 and 3 have 2.0-2.4 whereas only 2 have their CGPA <2.0

Remaining 35 participants are categorized as with very active lifestyle, the academic performance is as follows: 12 participants have CGPA 2.5-2.9 likewise 12 participants have 3.0-3.5, 6 participants

have>3.5, 3 participants have <2.0 and interestingly only 2 participants have their CGPA between 2.0-2.4

Fig.1

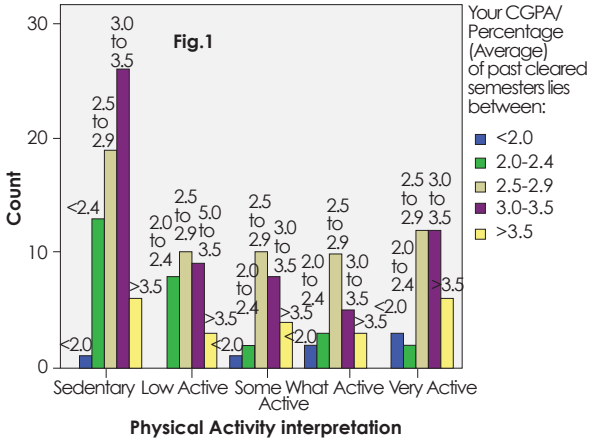

Table 1
Physical Activity interpretation* Yoiur CGPA/ Percentage(Average) od past cleared semesters lies between: Cross tabulation

		Your CGPA/ Percentage(Average) of past cleared semesters lies between:					
		<2.0	2.0-2.4	2.5-2.9	3.0-3.5	>3.5	Total
Physical Activity interpretation **Sedentary**	Count	1	13	19	26	6	65
	% within Physical Activity interpretation	1.5%	20.0%	29.9%	40.0%	9.2%	100.0%
Low Active	Count	0	8	10	9	3	30
	% within Physical Activity interpretation	.0%	26.7%	33.3%	30.0%	10.0%	100.0%
Some What Active	Count	1	2	10	8	4	25
	% within Physical Activity interpretation	4.0%	8.0%	40.0%	32.0%	16.0%	100.0%
Active	Count	2	3	10	5	3	23
	% within Physical Activity interpretation	8.7%	13.0%	43.5%	21.7%	13.0%	100.0%
Very Active	Count	1	13	19	26	6	65
	% within Physical Activity interpretation	8.6%	5.7%	34.3%	34.3%	17.2%	100.0%
Total	Count	1	13	19	26	6	65
	% within Physical Activity interpretation	3.9%	15.7%	34.3%	33.7%	12.4%	100.0%

Chi-square test was applied in order to find the co-relation between academic performance and physical activity. The results indicated non-significant relation between these two variables (p=0.42) as shown in table 2.

Table 2 **Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Monte Cario Sig. (2-sided)		
					95% Confidence Interval	
				Sig.	Lower Bound	Upper Bound
Pearson Chi-Square	16.45*	16	0.42	0.41[b]	0.34	0.48
Likelihood Ratio	17.61	16	0.35	0.44[b]	0.37	0.51
Fisher's Exact Test	16.10			0.39[b]	0.32	0.47
N of Valid Cases	178					

DISCUSSION

Multiple studies[6, 13, 10, 18] have been done in past which were done to find the relationship between physical activity and academic achievements, almost all focused on the school going individuals.

So we conducted our study on university going student's aged between 18 - 25 years. We took the physical therapy students. 178 participants were included in the study on the basis of inclusion criteria. The main focus of the study was to find the effect among activity level on school performance. Past studies[2,3,4,8,9] showed that school going students who are involved in physical activities are academically brighter as compared to those children who have sedentary life style. But our findings mismatch their findings because we took university going student aged between18-25 years. However, in universities, study methods are different as well as the psychology of university going students is also different. Precisely in university, study level are much harder than the school level, the duration of classes are also double as compare to school. Therefore, very less time is available for the university going students to take part in physical activities.

It was seen that in every age group from 18 to 25 years the majority of participants were sedentary in nature, which was also seen in a graphical representation. Importantly most of the students were sedentary in nature. Hence it is an alarming sign for us because sedentary lifestyle is one of the risk factor for obesity which will cause several fatal diseases like hypertension, myocardial infarction, stroke and cancer.

The main aim of the study was to find the effect among activity level and school performance.

CONCLUSION

There is non-significant effect of physical activity level on academic performance among university students, Physical activity should be encouraged in order to achieve other health benefits. In a nut shell, physical activity may have other systemic health benefits but it shows no significant effect on academic achievement.

REFERENCES

[1] World Health Organization. [internet]. 2014 [cited 2014]. Available from: www.who.int/topics/physical_activity/en/
[2] Merrim-Wesbster Dictionary. [internet]. 2014 [cited 2014]. Available from: http://www.merriam-webster.com/dictionary/achievement
[3] Penedo FJ, Dahn JR. Exercise and well-being: a review of mental and physical health benefits associated with physical activity. Curr Opin Psychiatry. 2005;18(2):189-193.
[4] Hillman CH Ericson K, Kramer AF. Be smart, exercise your heart: exercise effects on brain and cognition. Nat Rev Neurosci. 2008;9(1):58-65.
[5] Hoeger W, Hoeger SA. Principles and Labs for Fitness and Wellness. 10th ed. United States of

America: Yolanda cossuo; 2008.
[6] Rani BKJS, Indira S. Active education through physical education. Online Inter Interdiscip Res J. 2013;3(2):112-128.
[7] Ward A, Stoker HW, Murray-Ward M. Achievement and ability tests- definition of the domain. 1996.
[8] Scheuer LJ, Mitchell D. Does physical activity influence academic performance? Available from: www.sportsmedia.org/sportaplisnewsletter19.htm
[9] Ahamed Y, Macdonald H, Reed K, Naylor PJ, Liu-Ambrose1 T, Mckay H. School-based physical activity does not compromise children's academic performance. Med & Sci Sports & Exer. 2007;39(2).
[10] Strong WB. Evidence based physical activity for school-age youth. J Peds. 2005;146(6):732-737
[11] Sibley BA, Etnier J. The relationship between physical activity and cognition in children: a meta-analysis. Pediatr Ex Sci. 2003;15:243-256.
[12] Shephard RJ. Curricular physical activity and academic performance. Pediatr Exer Sci. 1997;9:113-125.
[13] Shephard RJ. Habitual physical activity and academic performance. Nutrition Reviews. 1996;54(4):32-36.
[14] Castelli DM, Hillman CH, Buck SM, Erwin HE. Physical fitness and academic achievement in third- and fifth-grade students. J Sports Ex Psychol. 29:239-252.
[15] Etnier JL, Salazar W, Landers DM, Petruzello SJ, Han M, Priscilla N. The influence of physical fitness and exercise upon cognitive functioning: a meta-analysis. J Sport Exerc Psychol. 1997;19:249-277.
[16] Dwyer T, Sallis JF, Blizzard L, Lazarus R, Dean K. Relation of academic performance to physical activity and fitness in children. Pediatr Ex Sci. 2001;13.
[17] Coe DP, Pivarnik JM, Womack CJ, Reeves MJ, Malina RM. Effect of physical education and activity. Med Sci Sports Ex. 2006:1515-1519
[18] Donnelly JE, Lambourne K. Classroom-based physical activity, cognition, and academic achievement. Prevent Med. 2011;52:32-42.
[19] Tremblay MS, Inman JW, Willms JD. The relationship between physical activity, self-esteem, and academic achievement in 12 year-old children. Pediatr Ex Sci. 2000;12(3):312-323.
[20] Shore S, Sachs M, Lidicker J, Brett S, Wright A, Libonati J. Decreased scholastic achievement in overweight middle school students. Obesity. 2008;16(7):1525-1538.
[21] Roberts CK, Freed B, McCarthey. Low aerobic fitness and obesity are associated with lower standardized test score in children. J Pediatr. 2010;156(5):711-718.
[22] Li Y, Dai Q, Jackson JC, Zhang J. Overweight is associated with decreased cognitive functioning among school-age children and adolescents. Obesity. 2008;16(8):1809-1815.
[23] Oxford Dictionaries. [internet]. 2014 [cited 2014 from: http://www.oxforddictionaries.com/definition/english/academic
[24] Grissom JB. Physical fitness and academic achievement. J Exer Physio online. 2005;8(1):11-25.
[25] Tudor-Locke C, Basset DR. How many steps / days is enough? Preliminary pedometer indices for public health. Sports Med. 2004;34:1-8