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Research Article

**RELATIONSHIP OF PHYSICAL ACTIVITY WITH BODY
IMAGE, SELF-ESTEEM SEDENTARY LIFESTYLE, BODY
MASS INDEX AND EATING ATTITUDE IN ADOLESCENTS:
A CROSS-SECTIONAL OBSERVATIONAL STUDY**¹Dr. Isma Iftikhar, ²Dr. Muhammad Hasnain, ³Dr. Sumra Anwar¹Ex House Officer, Mayo Hospital, Lahore.²MO, RHC Khabeki, Khushab.³WMO, BHU 19/8 BR, Mianchannu.**Abstract:**

The aim of this study is to observe the relationship of PA (physical activity) with self-esteem, body image, BMI (body mass index), eating attitude and sedentary lifestyle in adolescents.

An observational cross-sectional research has been done through Medline Database records of "Center of Adolescent Health", Barcelona Spain. According to records, there were volunteering adolescents of 13 to 18 years of age involved and analyzed using a specific physical activity questionnaire for the score of adolescents, questionnaire regarding body shape score, for self-esteem score there was a use of "Rosenberg Self-esteem Scoring" questionnaire score adolescent sedentary, EAT-26 for eating attitude test and Body Mass Index Z-score. These scales of different restrictions were based on regression and correlation.

A total of 191 girls and boys were comprised in this study, from those 191 25% had underweight and 75% were normal. Children with low PA were 77% (three fourth). The girls were moderately more sedentary (girls 83.9% vs. boys 72.1%). Mostly 90.05% of subjects did not have body image concerns and almost overall subjects had high or normal self-esteem. Nearly 1/4th of the subjects (with the ratio of 23.5%) had messy eating behaviors. Multiple regressions established the PA is dependent positively on the score of EAT 26 and ASAQ (Adolescent Sedentary Activity Questionnaire) score in girls, whereas in boys sedentary score (ASAQ score) was only variable associated to the questionnaire of PA for adolescents score.

Underweight and normal weight adolescents had minimum PA and beside this, almost all had normal body image and self-esteem. Physical activity was considerably associated with sedentary and eating behaviors.

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1. INTRODUCTION:

PA (physical activity) is the highest public health issues analyzed in this century, it is projected by WHO (World Health Organization) that more than two million annual deaths in the world and is associated to PA. The physical activity is one of the multiple influences which have generally a normal impact on self-esteem and body image. The advantages of physical activity on health are largely shown by the latest literature on science (Canpolat *et al.*, 2016).

Persons associated with positive body image are mostly engaged in physical activity as compared to those with negative body image. Accordingly, body image also affects the PA type also. In adolescents, it seems to be connected with self-esteem, as body image is widely affected at their look. Another particular factor of adolescent psychological health and development is their self-esteem, it has been observed accordingly that low self-esteem is linked with different social physical and psychological problems which may restrict in a successful transition to adolescence, it also includes anxiety, depression, eating disorder and in severe cases even suicide. Moreover, the disordered behavior of eating has also been found with different undesirable results comprised with elevated eating disorder risk and obesity, specifically in adolescents. The body image, physical activity, eating disorders and self-esteem seem associated with each other and present research was projected to analysis these attributes relationships in adolescents. (Duncan, al-Nakeeb and Nevill, 2013)

METHODS:

This observational cross-sectional research has been done through Medline Database records of "Center of Adolescent Health", Barcelona Spain under the time period from November 2015 to March 2017. Age group was 13 to 18 years for this study and in this research, the exclusions were a locomotor disability, chronic illness, and learning disability. A sample of 150 adolescents was projected and there 191 subjects were included in this research (Dhankar *et al.*, 2018).

A specific structure of the questionnaire has been generating accordingly, basically, the information was based on age, name (optional), educational qualification, gender and residence place. Measurement of weight has been done with no shoes and in light clothes. Height was also measured while all subjects were in no shoes and in standing position, without hair bands and hats (Dhankar *et al.*, 2018).

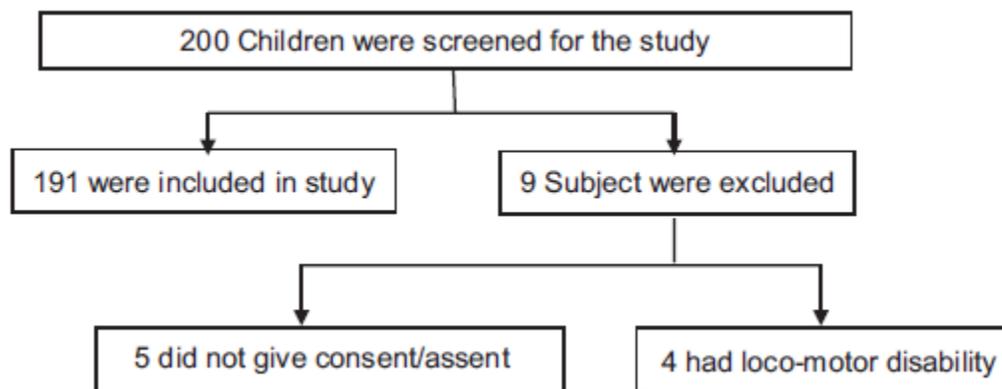
BMI (body mass index) was calculated specific formula (weight Kg/height (m²)) and SD scores were extracted while using sex and age-specific percentiles. Adolescents were also classified as healthy weight, underweight, obese and over-weight as per the growth reference data of WHO. Adolescents' PA was analyzed through a PA questionnaire. Every question is attained on a scale of five points. All participants are categorized through their PA as low as per the 1-3 scores, moderate with a 3-4 score and high with 4-5 scores. The sedentary attitude was analyzed using ASAQ and body image was observed while using a specific body shape questionnaire (BSQ) (Jinhee and ByungKon, 2016).

Every question is based on an answer of six points and "Likert" scale (vacillating from never to always). There are 4 categories for classification of the score which are "not worried regarding body shape" <81, slightly worried are 81-110, worried moderately 111-140 and finally extremely worried > 140. Similarly, self-esteem was analyzed with "Rosenberg Self-Esteem" score which is based on strongly agree up to strongly disagree. In this test, the achiever of higher score suggested as "Higher Self-Esteem" (Dhankar *et al.*, 2018).

Accordingly, eating attitudes were analyzed utilizing EAT "eating attitude test 26" and based on 26 item administrated. Every item is rated from one to six responses and the range was "never to always", according to this test participants are arranged to have a general attitude (with a score <20) and on the contrary they have an eating disorder (if score >20). Microsoft Excel software has been used for data collection entries and SPSS version 20 has been used for data analysis. CI (confidence intervals) was 95% and calculated for every variable, P<0.05 were measured significant statistically. Regression linear and co-relation analysis of multiple variables was also done (Jinhee and ByungKon, 2016).

RESULTS:

In the time period of study, 191 children were involved in this research after utilizing the criteria of inclusion and exclusion, (mentioned in below flow-chart). Accordingly, the results also shown in Table 1 below as the mean age of this same (SD=1.39) was 15.2 years with the roughly equal distribution of gender (45.55% girls and 54.45% boys). According to results 1/4th of boys and girls were considered underweight and other were normal in male and females.



(Source: (Dhankar et al., 2018))

Table 1: The results of various parameters

Characteristic	n (%)
Sex	
Male	104 (54.45)
Female	87 (45.55)
BMI	
Underweight	47 (24.61)
Normal weight	146 (74.87)
Over weight	1 (0.52)
Physical activity (PAQ-A)	
Low	148 (77.49)
Moderate	38 (19.90)
High	5 (2.62)
Body image (BSQ-34)	
No concern	172 (90.05)
Mild concern	13 (6.81)
Mod concern	4 (2.09)
Marked concern	8 (4.29)
Self-esteem (RSE)	
Low	1 (0.52)
Normal	97 (50.79)
High	93 (48.69)
Eating attitude (EAT-26)	
Normal	146 (76.44)
Disordered eating	45 (23.56)

(Source: (Dhankar et al., 2018))

3/4th (at the ratio of 77%) of participants had low physical activity. In this study, we observe that girls were more sedentary (83.9% females versus 72.1% boys). Both girls and boys use ten hours on inactive behavior. The major share of inactivity founded in small screens recreation devices such as a computer, mobile, and television. 90.5% have not any consideration relevant to body image. Self-esteem is almost normal in all participant and 1/4th of the respondents 23.56% had found eating behavior disorders. The low physical activity was linked with sedentary behavior increase (with Pearson Correlation Coefficient ($r = 0.424$, $n = 191$, $P \leq 0.005$)). inactive lifestyle also found an increasing trend and BSQ image score was “($r = -0.165$, $n = 191$, $P = 0.023$)” for sedentary measurement (Dhankar et al., 2018).

According to Pearson Correlation coefficient ($r = -0.181$, $n = 191$, $P = 0.010$) values of Body Mass Index were originated to be related negatively to eating scores and pointing that BMI in lower mode is more eating disorder chances. Similarly, body mass index scores were considered as positive related to BIS (Body image scores) with the help of Pearson Correlation coefficient $r = 0.157$, $n = 191$, $P = 0.03$, signifies that better body image has elevated BMI scores.

The analysis of “multiple linear regression” also performed as independent and dependent variable both for girls and boys accordingly, as given in Table 2.

Table 2: Regression linear analysis of variables

Dependent variable	Independent variable	Female			Male		
		B±SE	P	95% CI	B±SE	P	95% CI
PAQ-A	BMI Z score	0.031±0.043	0.468	-0.054-0.117	-0.016±0.033	0.638	-0.082-0.050
	RSE	-0.020±0.020	0.329	-0.060-0.020	0.000±0.013	0.978	-0.025-0.026
	EAT-26	0.012±0.005	0.036	0.001-0.022	-0.001±0.003	0.780	-0.008-0.006
	ASAQ	0.321±0.065	0.000	0.192-0.450	0.278±0.061	0.000	0.156-0.400
	BSQ-34	0.002±0.002	0.443	-0.002-0.006	0.005±0.003	0.098	-0.001-0.011
BSQ-34	RSE score	1.156±1.096	0.294	-1.024-3.336	-0.507±0.427	0.237	-1.355-0.340
	EAT-26 score	0.762±0.289	0.010	0.187-1.336	0.209±0.115	0.071	-0.018-0.437
	PAQ-A score	4.607±5.980	0.443	-7.292-16.505	5.548±3.324	0.098	-1.048-12.144
	BMI Z score	5.076±2.252	0.027	0.594-9.557	1.179±1.105	0.289	-1.014-3.373
	ASAQ score	-7.059±3.921	0.076	-14.862-0.743	-1.568±2.249	0.487	-6.030-2.895
RSE	EAT-26 score	0.009±0.030	0.763	-0.051-0.069	0.057±0.027	0.034	0.004-0.111
	PAQ-A score	-0.590±0.601	0.329	-1.786-0.606	0.021±0.792	0.978	-1.550-1.593
	BMI Z score	0.214±0.233	0.360	-0.249-0.677	0.281±0.260	0.282	-0.234-0.796
	ASAQ score	-0.286±0.402	0.478	-1.085-0.513	0.450±0.528	0.396	-0.597-1.497
	BSQ-34score	-0.012±0.011	0.294	-0.010-0.034	-0.028±0.024	0.237	-0.075-0.019
EAT-26	PAQ-A score	4.589±2.157	0.036	0.296-8.882	-0.818±2.919	0.780	-6.610-4.974
	BMI Z Score	-2.584±0.808	0.002	-4.192-0.976	-1.71±1.947	0.074	-3.591-0.169
	ASAQ score	-1.088±1.472	0.462	-4.017-1.841	-0.4321±0.952	0.825	-4.307-3.442
	BSQ-34score	0.104±0.039	0.010	0.026-0.182	0.157±0.086	0.071	-0.014-0.328
	RSE score	0.123±0.407	0.763	-0.687-0.933	0.781±0.364	0.034	0.058-1.503
BMI Z score	ASAQ score	0.064±0.191	0.737	-0.316-0.445	0.216±0.204	0.291	-0.188-0.620
	BSQ-34score	0.012±0.005	0.027	0.001-0.022	0.010±0.009	0.289	-0.008-0.028
	RSE score	0.048±0.053	0.360	-0.056-0.153	0.042±0.039	0.282	-0.035-0.119
	EAT-26 score	-0.043±0.014	0.002	-0.070-0.016	-0.019±0.010	0.074	-0.040-0.002
	PAQ-A score	0.209±0.286	0.468	-0.361-0.778	-0.144±0.306	0.638	-0.751-0.463

SE: Standard error; CI: Confidence interval; BMI: Body mass index; PAQ-A: Physical activity questionnaire for adolescents; BSQ: Body shape questionnaire; RSE: Rosenberg self-esteem; EAT-26: Eating attitude test-26; ASAQ: Adolescent sedentary activity questionnaire

(Source: (Dhankar et al., 2018)).

EAT 26 scores is the base of positive physical activity and ASAQ (inactivity score) in girls, whereas in boys ASAQ (inactivity score) was analyzed the only PA variable related score. Body image score (BSQ34) was not related statistically with a variable in males while in females EAT26 score and score of BMI Z highly contributed to BSQ34. For self-esteem (RSE) no researched variables was importantly

relevant to self-esteem score in females, therefore, a minor association has been found with the score of EAT in male ($P = 0.03$) (Jinhee and ByungKon, 2016).

BMI score, according to our analysis, was inversely linked to EAT-26 score in the female, therefore, there was no identification of this relation in males. There

was a strong positive link found in BMI-Z and body image score BSQ-34 in females identifying that elevated BMIZ score enhances the BSQ-34. It must be stated that no research had found any obesity but one respondent was overweight. Specifically, a t-test (shown in Table 3) was implemented utilizing lesser PAQ-A and on the other side moderate or high PAQ-A according to the independent variable and the score of EAT, a score of RSE, BSQ-34 score and score of BMI Z a per independent variable. An important divergence is there in low PAQ-A score (which was M 14.04, SD 11.54) as compared with high PAQ A (SD 24.4 and M 33) with score of EAT -26 $t=(189) = -2.29$, $P = 0.023$ (Jinhee and ByungKon, 2016).

DISCUSSION:

This research shows that 77.5% of respondents are involved in nil or very limited physical activity analyzed by the scale of PAQ-A, after and in the time period of school. According to the World Health Organization, 81% of children who are school going are inadequate physical activities throughout the globe. They are less active 78% girls and 83% boys not accomplishing the WHO recommendations. The given reports showed that from WHO Region of South-East Asia, the children assessed by far the lowest pervasiveness of inadequate physical activity (with the rate of 74%) (Okumusoglu, 2017).

Table 3: T-test for independent sample

	Mean±SD		P	95% CI
	Low PAQ-A	Mod/high PAQ-A		
BSQ-34 score	56.81±21.20	85.50±37.47	0.006	-58.57-1.20
RSE score	25.39±3.10	23.00±2.82	0.280	-1.95-6.73
EAT-26 score	14.04±11.54	33.00±24.04	0.023	-35.29--2.62
BMI Z score	-1.11±1.30	-0.050±0.707	0.512	-2.42-1.21

SD: Standard deviation; CI: Confidence interval; BSQ: Body shape questionnaire; RSE: Rosenberg Self Esteem; EAT-26: Eating attitude test-26; BMI: Body mass index; PAQ-A: Physical activity questionnaire for adolescents

(Source: Okumusoglu, 2017)

Our research observations strongly helped the physical activity global low level among children. Most of the children in this study either nil or have little concern about the BIS 90.1% and on the other hand have high or normal self-esteem (99%) in both males and females which is almost identical in previous researches (Shaban et al., 2016).

Although at the global level dissatisfaction is going to increase with Body Image, specifically leading to low in self-esteem and it also found only 38% of respondents observing the BI as normal, similarly, most of the girls are not happy with their BI as competed with male persons (Okumusoglu, 2017).

It is important the besides being inactive, respondents do not show any issue about the self-esteem and body image. This shows that PA is not a big issue for body image or/and self-esteem. Both boys and girls are utilizing more money for their relaxing time utilizing TV, Mobile, and Computer in behaviors of sedentary. In males 10.5h/day, SD was =3.9 $P=0.000$ are basically spending more specific time on TV, Mobile and Computer as compared with girls 9.7 h/day SD =

3.8 $P = 0/000$) (Shaban et al., 2016).

According to EAT scores, 23.5% in both girls and boys were described as having disordered in eating. If we compare results from different other researches which represented the prevalence of eating disorder then we found in Turkey it was 45.2, in the United States 22% to 26%, in Japan 35% in Canada 16% and Singapore 10.5% (Kelly, Vimalakanthan and Miller, 2014).

CONCLUSION:

Physical activity, self-esteem, eating behaviors and body image are associated with each other and potentially reconciled by the same psychological traits both in girls and boys. Even though adolescents majority have normal eating behaviors, 26% significant numbers show to have eating disorders and they need appropriate counseling to manage it. PA was very minimal in under-weight and normal weight girls and boys but it did not have body image and self-esteem association which advice that PA is hardly a body image and self-esteem concern. Finally, this research can further guide us in any

projection and designing publicity promotions to enhance the awareness of PA among adolescents.

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