

Impact of Lifestyle on the Health Related Physical Fitness of Children 7 – 9 Years Attending International Schools.

ManjushaAtul Bhakay^{1*} and Sabiha Vali²

^{*1}*S.M.R.K.B.K.A.K. MahilaMahavidyalaya, Nashik*

²*Dept. of Home Science, RSTM Nagpur Uni. Nagpur*

Corresponding Author: ManjushaAtul Bhakay

Date of Submission: 9-08-2017

Date of acceptance: 24-08-2017

I. Introduction

Health related physical fitness is dependent on both, lifestyle related factors, such as daily physical activity levels and nutritional habits and genetic factors and is an important indicator of health status.¹ Physical fitness is a complex phenomenon with several dimensions, related to health and well-being and influenced by most dimensions of life. Nature can explain some aspects of physical activity and physical fitness like age, sex or heredity, whereas nurture and culture can explain others like socio economic factors, diet, environment or leisure time habits.² Furthermore, these factors are often associated, with one another and habitual physical activity and then health related fitness could be mediated by all the variables.

Pre-adolescent children are a study in perpetual motion. Children are invariably running, jumping ,throwing, catching and kicking in a spontaneous action or engaging in physical activity which is untutored and unstructured. Truly they are doing what comes naturally to them and they are enjoying themselves. In contrast to these images are the pictures of children sitting passively in the car or bus for the “school activity”, watching television for up to one-third of their waking time, and participating in very few school physical education programs as other curriculum pressures take precedence. Clearly, there are paradoxes in the lifestyle of children today that raise important questions. Part of the answer lies in the environment within which the children now find themselves. Many of the current health concerns relating to children’s physical activity and their sequels may be seen as a result of conflict of normal physiology trapped within a pathological environment.

Childhood obesity is one of the most serious public health challenges of the 21st century. The problem is global and is steadily affecting many low and middle-income countries, particularly in the urban settings. The prevalence has increased at an alarming rate. Globally, in 2010 the number of overweight children under the age of five years was estimated to be 42 million. Close to 35 million of these were living in developing countries (WHO).

Socio-economic status (SES) is an important determinant of the shared family environment. Numerous studies have demonstrated an association between SES and obesity . SES can influence lifestyle choices and behaviours, area of residence and food affordability, all of which are factors that have been shown to be associated with obesity.

Definition of Lifestyle :The constellation of habitual activities unique to a person, which lend consistency to activities, behaviors, manner of coping, motivation and thought processes and define the way in which he / she lives ; Lifestyle activities include diet, level of physical activity, substance abuse, and social and personal interaction.

Lifestyle is a composite of motivations, needs and wants and influenced by factors such as culture, family, reference groups and social class.³

Healthy Lifestyle:Leading a healthy lifestyle means getting the essentials that the body needs and using the resulting power and energy to their fullest. This helps one to look and feel the best, live actively and for long. To begin building the foundation for good health, focus should be on getting the right nutrition, rest, relaxation and exercise that fulfill the body’s physical and mental requirements.⁴

Physical activity and physical fitness are important in public health primarily as they affect health outcomes. Physical activity is protective against a number of important chronic diseases.⁵ The health value of childhood physical activity is its relation to obesity and to physical fitness and functional capacity.⁶ Physical fitness can be thought of as an integral measure of most, if not all the body functions involved in the performance of daily physical activity and / or physical exercise.⁷ Over the past decade, professional groups have moved gradually away from the traditional “motor performance” interpretation of physical fitness towards a more “health related”

view of fitness. The characteristics included in the latter are cardio respiratory endurance, muscular strength and endurance, body composition and flexibility.⁸ These, health related components are usually associated with disease prevention and health promotion.

II. Aim and Objectives

Primary Outcome:

1. To assess the components of health related physical fitness of children aged 7 to 9 years.

Secondary Outcome:

1. To study the physical activity pattern of the children aged 7 to 9 years.
2. To evaluate the diet of the children aged 7 to 9 years.

III. Methodology

236 children (116 girls and 120 boys.) from three different International schools (IS), studying in standard 2nd, 3rd and 4th were selected by purposive sampling. The schools located in Nashik city were selected based on easy approachability, good response, co-operation from the authorities and ease of communication. These International schools followed the Cambridge Curriculum, namely ICSE and IGCSE. All the schools had a huge play ground with only limited students in the classroom (approximately 20 to 25 students in each class). The fees were also very high, approximately Rs.1.6 lakh per annum. These schools had a bus service to pick up and drop the children from / to their home. One International School also had a boarding facility, for students from outstation cities.

Inclusion criteria:

1. In purposive sampling, only children whose parents gave the consent for performing the fitness tests and filling the questionnaires during the study were included in the study.

Exclusion criteria:

1. Physically handicapped children were excluded from the study.
2. Children having some medical problem like asthma, heart problems etc were excluded from the study.
3. Children whose parents did not give consent for the study were also excluded.

The following health related physical fitness components were assessed:

1. Muscular strength and endurance – bent knee sit ups /min test.
2. Cardio respiratory endurance --- 1 mile run / walk test.
3. Body composition:
 - a. Body weight –nearest to 0.1 kg was taken using certified electronic scale.
 - b. Height – nearest to 0.01m was measured by Standard stadiometer.
 - c. BMI --- Calculated as Weight (kg)/ Height (m) 2
 - d. Waist measurement – Measuring tape
 - e. Waist to Height Ratio – Calculated as Waist/ Height
4. Flexibility --- sit and reach test.

A questionnaire was given to the students to elicit information regarding the physical activity and dietary pattern.

The data obtained on different parameters was coded and entered in SPSS sheet for further analysis. Statistical analysis was done by using SPSS software version 16.0.

IV. Result and Discussion

The field of anthropometry encompasses a variety of human body measurements, such as height and body size, weight, skin-fold thickness, and circumferences. Anthropometry is a key component of nutritional status assessment in children. Anthropometric data for children reflects their general health status, dietary adequacy and growth and development over time.

Table 1: Mean Anthropometric Measurements of Children

S.No	Parameter	Mean, Standard Deviation, Range	IS (n=236)
1.	Age (Years)	M	8.00
		SD	.81
2.	Height (M)	M	1.30
		SD	.07
3.	Weight (Kg)	M	28.96

		SD	7.68638
4.	BMI	M	16.81
		SD	3.32

Table no 1 shows the mean age, height, weight and BMI of children attending International school. The mean age of children was 8 years, these children were studying in standard three. The mean height was 1.30 meters, according to WHO the mean height of girls at this age should be 126.5 cms, for boys of same age the mean height is 127.2 cms. This indicates both girls and boys of 8 years were taller. The mean weight of 8 years old was 28.96 Kg. WHO standards for weight for 8 year old girl is 25.02 Kg and for boys it is 25.41 Kgs. The results indicate that both girls and boys were having excess weight. The mean BMI of 8 years old being 16.81. The mean BMI of 8 years old girls should be 15.68 and for boys of same age the mean should be 15.73, according to WHO standards for BMI for age. Since the height and weight of these children were more, the BMI was also higher than the standards.

Table 2: Mean Height (m) of Girls Distributed Age Wise

School	Mean, Standard Deviation, Range	Height (m)					
		7 years	% *Deficit/ Excess ** (Percentile)	8 years	% *Deficit/ Excess ** (Percentile)	9 years	% *Deficit/ Excess ** (Percentile)
IS	M	1.22	+1.74% (>50 - <75)	1.29 (0.07)	+0.02% (75 th)	1.36 (0.07)	+2.73% (75 th)
	SD	.06		.07		.06	
	n	39		39		38	

*Compared to WHO Standards, **Compared to WHO Standards, (No given in parenthesis indicate mean increment in weight in kg), (No given in bold parenthesis indicate percentile)

The 7 year old IS girls showed a slight excess of mean height (+1.74 %) when compared to WHO standards. IS girls are between the 50th and 75th percentile for their height, indicating that they are growing normally. As age increases, there is an increase in height also. This fact was confirmed in the 8 year old girls. IS girls had an increment of 7cms in their mean height from 1.22 m at 7 years to 1.29m at 8 years. When the mean height of the girls at each age was compared to the WHO standards 2007, it revealed that the mean height of IS girls was also very near to the mean height of an average 8 years old girl (+0.02 %). The IS girls have shown similar increase in mean height (7cms) at both 8 and 9 years of age. When the 9 year old girls were compared to WHO standards, the IS girls showed an excess of +2.73 %. Girls from IS show growth in mean height which is reflected in an increment at all ages as compared to WHO standards.

Table 3: Mean Height (m) of Boys Distributed Age Wise

School	Mean, Standard Deviation, Range	Height (m)					
		7 years	% *Deficit/ Excess ** (Percentile)	8 years	% *Deficit/ Excess ** (Percentile)	9 years	% *Deficit/ Excess ** (Percentile)
IS	M	1.26	+3.77% (>75 - <85)	1.32 (0.06)	+3.68% (>75 - <85)	1.35 (0.03)	+1.90% (>50 - <75)
	SD	.05		.05		.06	
	n	39		39		42	

*Compared to WHO Standards, **Compared to WHO Standards, (No given in parenthesis indicate mean increment in weight in kg), (No given in bold parenthesis indicate percentile)

The mean height of IS boys aged 7 years is higher when compared to WHO standards (+ 3.77%). The IS children lie between the 75th and 85th percentile indicating they are above average. At 8 years, the IS boys show a constant increase in height and they lie between the 75th and 85th percentile. The IS children of 9 years

show an increase in mean height by 3 cm annually. Growth in mean height is also from an excess of + 3.68 % for 8 years to + 1.90 % for 9 years. The data of the mean height measurement of children belonging to international school have positively reflected increment in height.

An article on growth and pubertal development in children and adolescents: effect of diet and physical activity by **Rogol AD et al (2000)**⁹ also suggests that the longitudinal growth of an individual child is a dynamic statement of the general health of that child. Because of the wide variation among individuals in the timing of the pubertal growth spurt, there is a wide range of physiologic variations in normal growth.

Seeja TP et al (2009)¹⁰ in their study on children stated that a child's height reveals the past nutritional status and is closely related to genetic factors.

Table 4: Mean Weight (kg) of Girls Distributed Age Wise

School	Mean, Standard Deviation, Range	Weight (kg)					
		7 years	% *Deficit/ Excess ** (Percentile)	8 years	% *Deficit/ Excess ** (Percentile)	9 years	% *Deficit/ Excess ** (Percentile)
IS	M	23.66	+5.47% (>50- <75)	27.76 (4.10)	+9.86% (>50<75)	35.46 (7.70)	+21.79 % (>85 - <95)
	SD	5.37		6.63		8.96	
	n	39		39		38	

***Compared to WHO Standards, **Compared to WHO Standards, (No given in parenthesis indicate mean increment in weight in kg), (No given in bold parenthesis indicate percentile)**

The data in table no. 4 indicates that the mean weight of 7 year old girls is in excess of WHO standards (+5.47%). As per WHO weight-for-age standards the mean weight of 7 year old girls is 22.37 kg. The IS girls weigh 23.66 kg. Weight-for-age for IS girls is more and they lie between the 50th to 75th percentile.

The IS girls of 8 years show a mean increase of 4.10 kg at 8 years and are in excess by +9.86% when compared to WHO standards. The WHO percentile for weight-for-age, shows that 8 year old girls show no change in weight increment and still lie between the 50th and 75th percentile.

The IS girls at 9 years, show a steady increase in their weight and at this age are in excess of their mean weight (+21.79%). In these IS girls the increase in mean weight from 8 year to 9 year is also more (7.70kg) than the increase in mean weight from 7 year to 8 years (4.10kg.) The IS girls have put on more weight for age and now are placed between the 85th and 95th percentile, in a way moving towards obesity.

Table 5: Mean Weight (kg) of Boys Distributed Age Wise

School	Mean, Standard Deviation, Range	Weight (kg)					
		7 years	% *Deficit/ Excess ** (Percentile)	8 years	% *Deficit/ Excess ** (Percentile)	9 years	% *Deficit/ Excess ** (Percentile)
IS	M	26.08	+12.23% (85th)	28.83 (2.75)	+11.85% (75th)	31.92 (3.09)	+11.95% (75th)
	SD	4.97		6.31		7.37	
	n	39		39		42	

***Compared to WHO Standards, **Compared to WHO Standards, (No given in parenthesis indicate mean increment in weight in kg), (No given in bold parenthesis indicate percentile)**

According to WHO standard of mean weight-for-age chart, a 7 years old boy should have a mean weight of 22.89 kg. From the table it is observed that the 7 year old boys have an excess mean weight of (+12.23 %). At the age of 7 years, the IS boys show a higher weight when compared to WHO weight for age (percentile) and lie at 85th percentile.

The IS boys of 8 years age have put on 2.75 kg more compared to the 7 year old boys (28.83 kg for 8 years, 26.08 kg in 7 year). They are also in excess of mean weight (+11.85%) when compared to WHO standards. The IS boys are now placed at 75th percentile with respect to WHO weight for age.

The 9 year old IS boys show an increment of 3.09 kg, and are again in excess of mean weight (+11.95%), which is quite similar to their excess in mean weight at 8 years (+11.85%). This indicates a steady growth in mean weight in these boys. The IS boys continue to be at the 75th percentile.

Seeja TP et al (2009) in the result of their study on “Augmenting BMI and waist to height ratio for establishing more efficient obesity percentile among the school going children” state that weight is an indicator of present nutritional status and is influenced by environmental factors. This is supported by the observation of mean weight of IS children in the present study.

The greater mean weight in IS children (higher socio economic status) in the current study is supported by **Tharkar S et al (2009)**¹¹ in their study titled “Impact of socio economic status on prevalence of overweight and obesity among children and adolescent in urban India”.

Table 6: Mean BMI of Girls Distributed Age Wise

School	Mean, Standard Deviation, Range	BMI					
		7 years	% *deficit / Excess **(Percentile)	8 years	% *deficit / Excess **(Percentile)	9 years	% *deficit / Excess **(Percentile)
IS	M	15.49	+ 2.95% (50 th)	16.31 (0.82)	+ 3.90% >50 - <75	19.08 (2.77)	+ 15.65% (>85 - <95)
	SD	2.45		2.84		4.37	
	n	39		39		38	

***Compared to WHO Standards, **Compared to WHO Standards, (No given in parenthesis indicate mean increment in weight in kg), (No given in bold parenthesis indicate percentile)**

From the data presented in table no. 6 it is observed that the IS girls have an excess mean BMI (+2.95 %). At 7 years, the IS girls are placed at the 50th percentile indicating that their growth is normal. The 8 year old IS girls show an increment of 0.82. The IS girls continue to be in excess of their mean BMI when compared to WHO standards (+ 3.90%).

At 8 years the IS girls continue to be at the same position of percentile (between 50th and 75th percentile).

The excess in mean BMI of IS girls at 9 years has increased drastically (+ 15.65 %). The IS girls, have moved between the 85th to 95th percentiles.

Table 7: Mean BMI of Boys Distributed Age Wise

School	Mean, Standard Deviation, Range	BMI					
		7 years	% *Deficit/ Excess **(Percentile)	8 years	% *Deficit / Excess **(Percentile)	9 years	% *Deficit / Excess **(Percentile)
IS	M	16.20	+4.43% (>50- <75)	16.48 (0.28)	+4.55% (>50-<75)	17.33 (0.85)	+7.41% (>75 - <85)
	SD	2.27		3.37		3.22	
	n	39		39		42	

***Compared to WHO Standards, **Compared to WHO Standards, (No given in parenthesis indicate mean increment in weight in kg), (No given in bold parenthesis indicate percentile)**

The data from table 4.2.11 shows that the mean BMI of IS boys is 16.20. When compared to WHO standards, the IS boys show an excess (+ 4.43%) mean BMI.

When the 7 year old IS boys were compared to WHO standards (BMI for age – percentile), it was observed that they lie between the 50th and 75th percentile.

At 8 year the IS boys continue to be in the same position of percentile, that is between the 50th and 75th percentile. The IS boys aged 9 years continue to be in the excess mean BMI (+ 7.41)

The 9 year IS boys show an increase in BMI and are between the 75th and 85th percentile. The data reveals that the IS boys have maximum increase in their mean BMI from 7 to 9 years (1.13).

Observations from the data point out strikingly to the differences in the anthropometric measurements of the subjects when analyzed according to age and gender as well as the type of school. The economic status of the

parents affects the dietary pattern and eating behavior of children and their physical health and is also ultimately, perhaps the most influencing factor deciding the school to which the child is sent.

Fitness Component Measurements of Children:

Table 8: Mean Fitness Components of Children According To School

S. No	Fitness Components	Mean, Standard Deviation, Range	Type of school
			IS (n=236)
1	Muscular strength and endurance (Bent knee sit ups / min)	M	19.38
		SD	8.91
2	Cardio – respiratory fitness – completion of test *	M	1.86
		SD	.33
3	Cardio – respiratory time (completion of test in min)	M	11.09
		SD	1.95
4	Flexibility (Sit and reach in inches)	M	12.97
		SD	3.04
5	Waist to height ratio	M	.46
		SD	.05

The mean of fitness components is shown in table 8. On an average the children could perform 19 – 20 sit ups per minute which is a measure of muscular strength and endurance. It is observed from the above table that maximum number of children from IS could finish the 1 mile run test. The range for this test is coded as follows- 1 meaning that the children could not complete the run, and 2 meaning that the children could finish the 1 mile run test.

With regard to the time of completion of the 1 mile run test (which is performed to test the cardio-respiratory fitness), the IS children completed the test in 11.09 mins. The children were quite good in flexibility component. With regards to mean waist to height ratio these children were within the normal range. Normal waist to height ratio should be 0.5.¹²

Table 9: Frequencies of Physical Fitness Components (Percentile)

S. No	Fitness Component	0	90th percentile	75th percentile	50th percentile	25th percentile	10th percentile	poor performance	Total
1	Muscular Strength and Endurance	--	0.4%	14%	28.6%	14%	8%	35%	100
	Cardio respiratory fitness -- time	13%	2%	8%	34%	17%	17%	9%	100
	Flexibility	--	11%	20%	22%	10%	14%	23%	100

Regarding muscular strength and endurance only 0.4% children from IS are at the 90th percentile. Majority of the IS (35%) children performed poorly in the sit up test.

With respect to cardio-respiratory fitness (time taken to complete the test), observations from the table show that 2 % IS children are on the 90th percentile and 9 % children with poor performance. 13 % of the children could not complete the test.

The result of flexibility fitness category indicates that the children from all the schools have done well in the sit and reach test.

Table 10: Cardio-respiratory Fitness - Completion of Test by the Children

S.No	Type of school	Cardio Fitness Category		Total
		Could not finish the test	Could finish the test	
2.	International school	13.1%	86.9%	100

The above table reveals that majority of them could finish the 1 mile run test indicating good cardio-respiratory tolerance to exercise and 13.1 % of them could not complete the test.

Table 11: BMI

S.No	Type of school	BMI Category				Total
		High risk >= 18.3	Some risk >=17.6	HFZ 17.5 - 13.5	Very lean <=13.4	
1.	International School	22%	5%	61%	12%	100

The BMI category of the children is shown in table 11 The table reveals that maximum number of children from IS (22% children) are in the high risk category (BMI > = 18.3).

Table 12: Waist to Height Ratio (WHtR)

S.No	Type of school	WHtR category		Total
		high	normal	
2.	International School	22%	78%	100

From table no. 12 it is observed that 22 % of IS children have a higher WHtR.

Physical Activity Pattern of the Children :

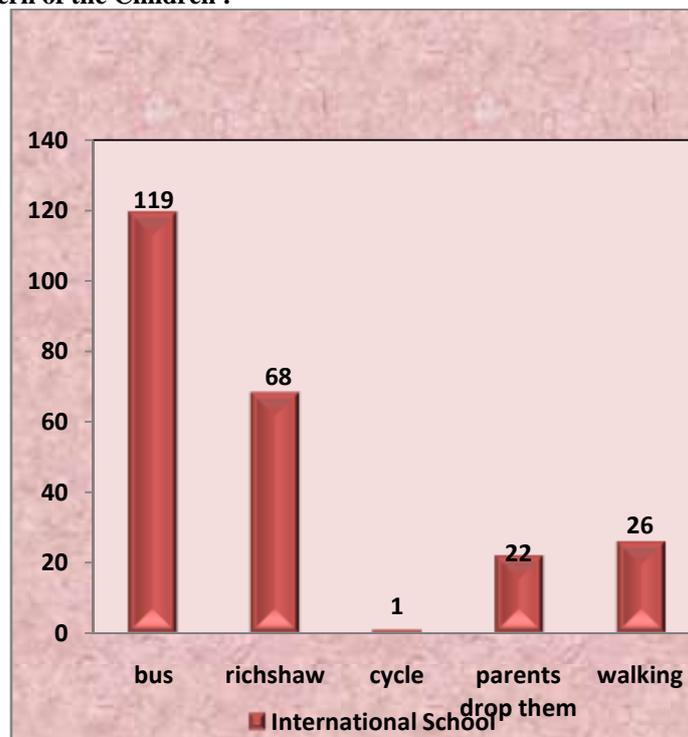


Fig.1: Mode of Commuting to School by Children from Different Schools (Frequency)

119 IS children (50.5%) come by school bus, 68 children (28.8%) travel by rickshaw, 1 child (0.4%) comes cycling, 22 children (8.9%) are dropped to the school by the parents.26 children (11.4%) come walking (they stay in hostels inside the school campus, a distance of less than a km).

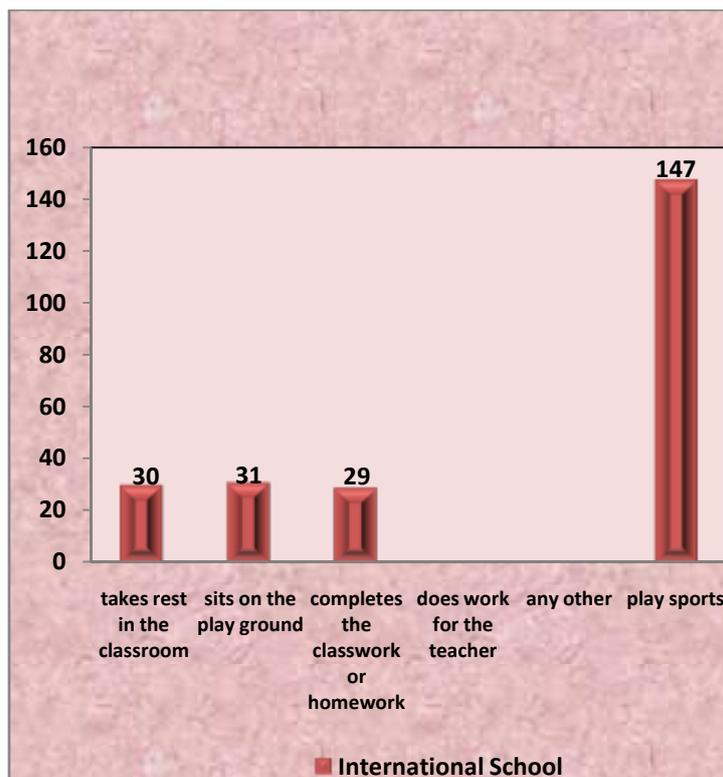


Fig 2: Activity of the Child during Physical Training (PT) Class (Frequency)

Physical training classes are mandatory in the schools. IS having physical training class daily. Having physical training class did not equate to all the children playing sports during that time. In IS, 147 children (62.3%) play sports during the physical training class, 30 children (12.7%) do not play sports and 59 children (25.0%) sometimes play sports. From those who do not play sports, nearly similar numbers take rest in the classroom (n=30), sit on the play-ground (n=31), complete the class work or home work (n=29).

Play is an universal and profound process that has evolved in both animals and humans. It is spontaneous, exploratory and intrinsically motivated. When children play freely they also exert themselves physically and they may spend more time engaging in the activity and thus also be more active for longer periods of time. The recent trend is that the school children concentrate more on academics and are involved in less sports and activities. Leisure hours are spent in watching television or playing computer / video games, thus explaining the sedentary lifestyle of today's school children.^{13,14,15,16}. Similar results were seen in the present study wherein children were involved in less sports and activities even in recess time and physical training class.

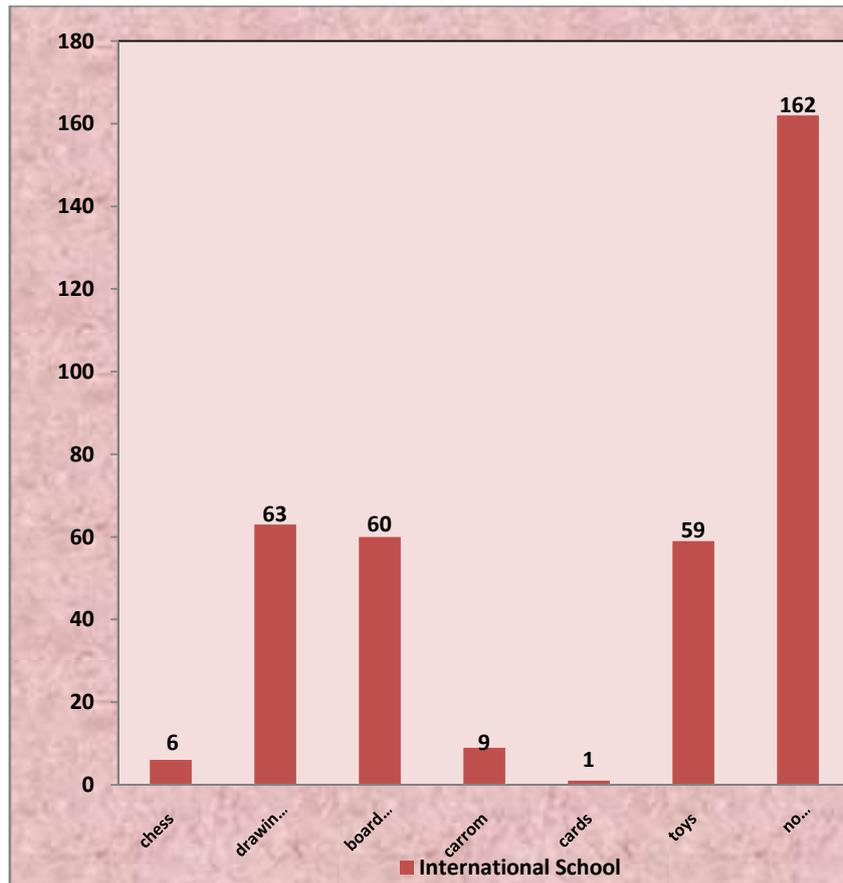


Fig 3: Type of Indoor Play According to School Attended (Frequency)

162 IS children (68.6%) are not engaged in any form of indoor games. Many of them are involved in drawing / painting (n=63), board games (n=60) and toys (n=59).

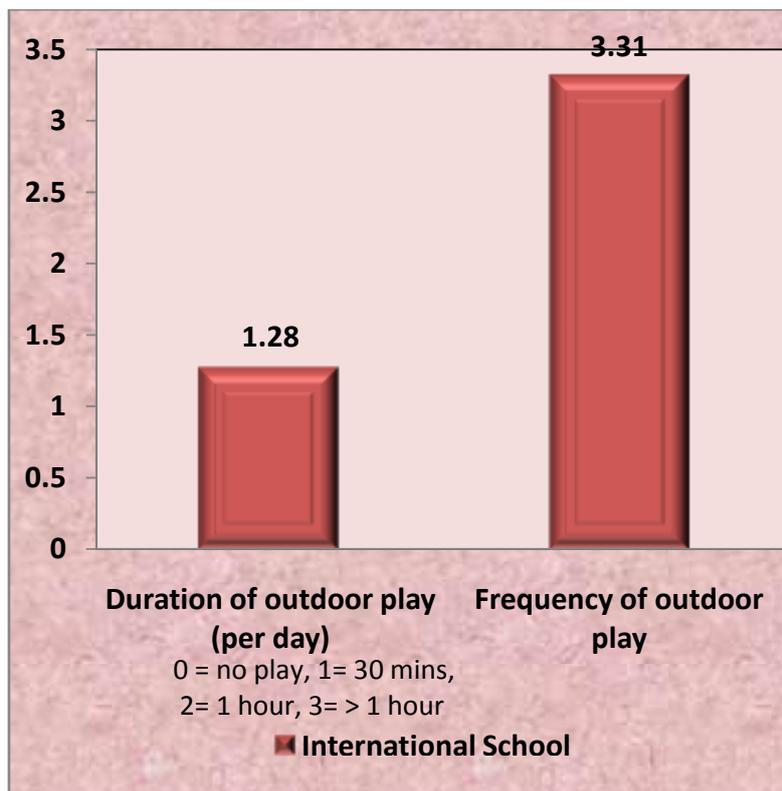


Fig 4: Mean Duration and Frequency of Outdoor Play

The mean duration of outdoor play of IS children is 1.28. These children play for 30 min per day. The mean frequency of outdoor games played per week shows that IS children play for approximately 3 times / week. Exercise is defined as a behavior that is planned, structured and repetitive and undertaken for the purpose of improving or maintaining physical fitness. Several issues contribute to the increasingly sedentary lifestyle of some children. In many cases children rely on parents when it comes to the activities they undertake. Families live exceedingly busy lives with limited time for children’s free play and unstructured activities. To make the most “of the time” they have, many middle class, upper class parents enroll children in organized sports that offer strict schedules, structured exercise and play.¹⁷

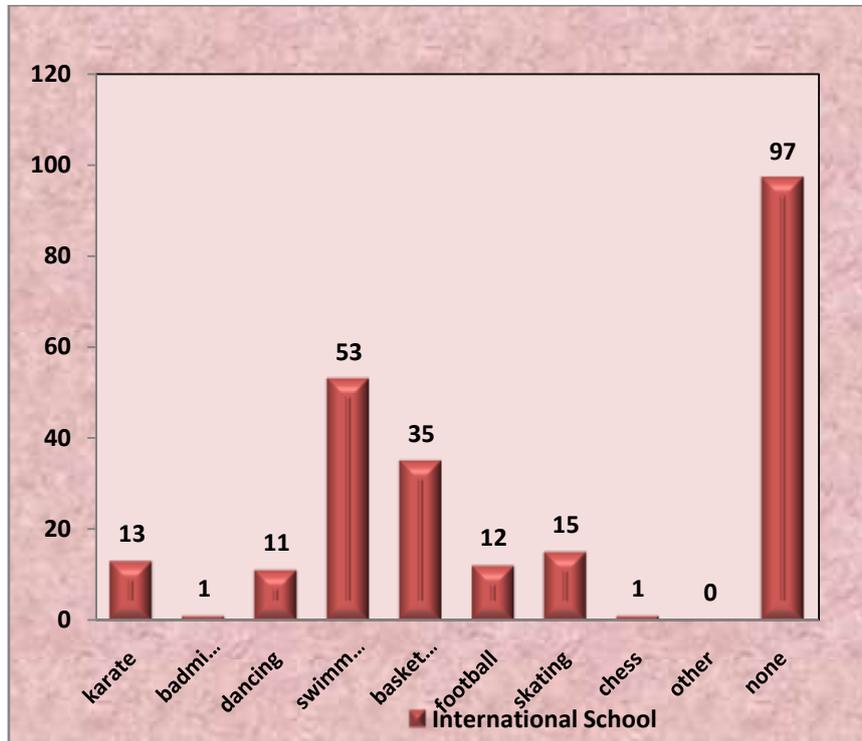


Fig 5: Type of Active / Structured Play (Frequency)

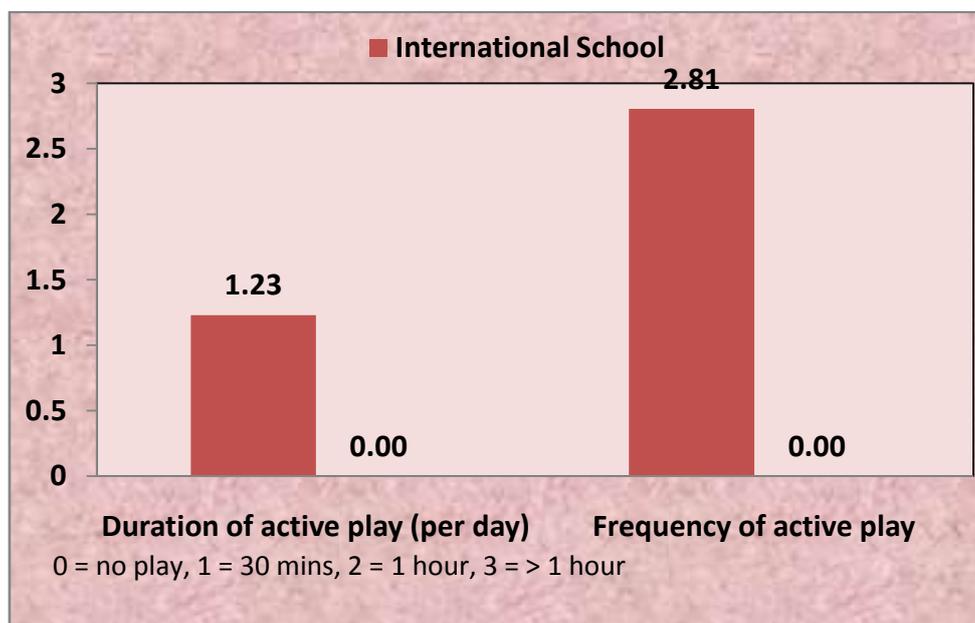


Fig 6: Mean Duration and Frequency of Structured Play

Leisure Time Activities of the Children :

Television viewing, computer games and other sedentary behaviors are thought to compete with physical activities

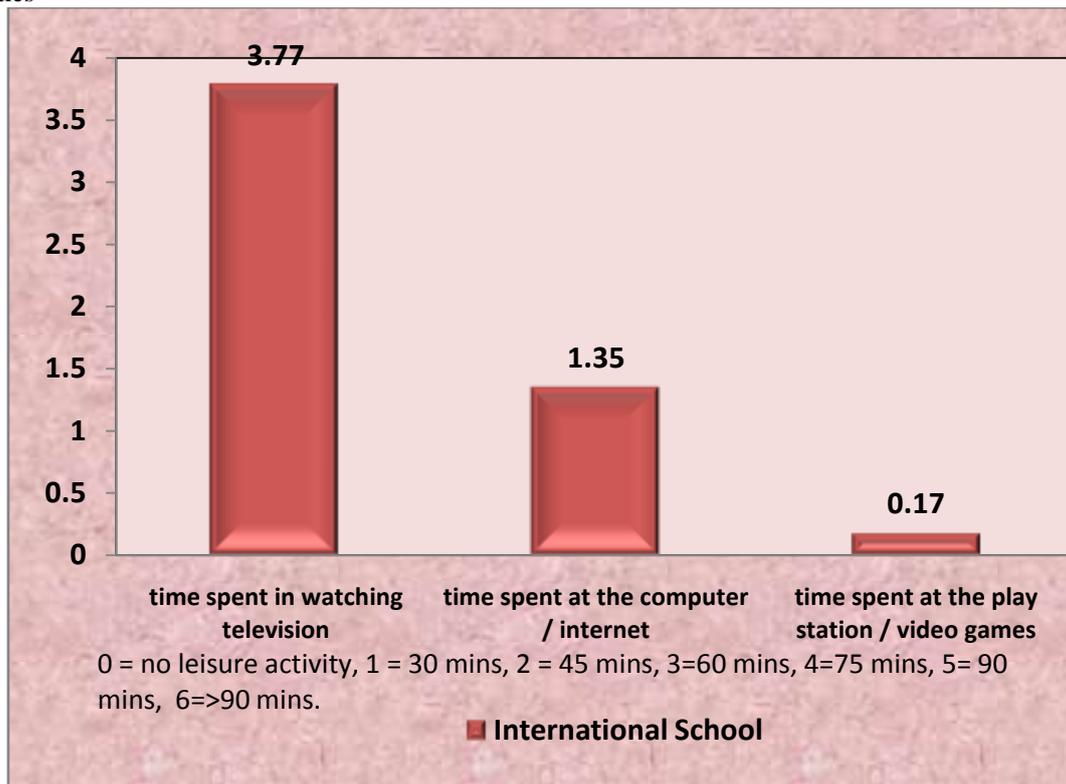


Fig 7: Mean of Time Spent on Leisure Activities

Eating Habits of the Children:

Rapid epidemiological transition is currently sweeping across India, which has direct impact on food habits and lifestyle. Springing up of fast food outlets and easy availability of junk food is a matter of concern. Today’s children prefer these foods to fruits and vegetables. Children from private schools consume more of fast food items and carbonated drinks as all these food items are easily available in their school canteens.

The IS children eat fried food nearly once a week (mean 3.39). The higher frequency of eating fried food is reflected in the higher BMI of IS children. All the children like sweet preparations. IS children have sweet preparations nearly twice a week. These school children consume outside food once a week. It is observed that in the mean consumption of Maggie, chips, kurdure and chocolates was high in these children. The easy accessibility, affordability of the junk foods and influence of advertisements on television may be responsible for the increased mean consumption of these foods by the IS children.

Children have ice-creams and soft drinks three times in a week. IS children have better exposure to a variety of foods which is reflected in their mean consumption of other foods / week. Similar results were found by **Supreet Kaul al (2008)**¹⁸ in their study on consumption of energy dense fast food which showed that about 12% of children from high income group schools consumed fast food more than four times in a week,

In contrast to junk foods consumption an attempt was made to find out the mean consumption / week of healthy foods by the children The children of IS eat a variety of nuts and oilseeds like groundnuts, sesame, cashew nut, almonds, walnuts etc. Children consume leafy vegetables thrice in a week. , it is because parents are aware of their nutritional contents and hence consume them in a variety of forms. These children consume more of spinach. Fruits are consumed 4 – 5 times in a week. IS children consume milk and milk products on daily basis,

An attempt was made to find out whether the children consumed breakfast or not and the reasons for not having breakfast. Majority of children from IS (n=207,85%) have breakfast, the remaining 29 children(15%) do not have breakfast and the reasons are as follows –18 (7%) due to lack of appetite, 6 children (2%) for lack of time, 11 children (5%) are not very keen about it and 3 (1%) for any other reason. The IS children are provided breakfast by the school if he / she so desires, which includes Idli chutney, poha, upama etc.

Effect of Media Vs Food Consumption of the Children :

The eating habits of children as related to their parents’ free purchasing power, watching television or the impact of television were assessed. Children “sometimes to frequently’ consume food sitting in front of the television. The children from International schools are influenced by the advertisements seen on the television

and this influences their decision to purchase some food items. The snacks and sweets in their homes are kept within their reach. They have an easy access to snacks and sweets.

According to the Centers for Disease Control and Prevention (CDC), an unhealthy diet and a sedentary lifestyle are associated with being overweight, which can increase risk for heart disease and other non-communicable diseases. On the other hand, a healthy, well balanced diet along with regular exercise of all type can reduce the risk for these and other unhealthy conditions. Smart diet and regular exercise are essential for a healthy lifestyle from childhood through the later years.¹⁹

V. Conclusion

In today's world, the number of children that are out of shape and sedentary are increasing rapidly. There is a decrease in the endurance and strength capabilities of the young children due to more time spent using technology, busy working parents, safety concerns and lack of places to play.

Socioeconomic position (SEP) is an important determinant of health as it can influence an individual's attitudes, experiences and exposure to a range of risk factors Potential environment strategies and modified lifestyle including balanced diet and physical activity, since the very beginning of life are considered to have a strong impact on prevention of disease during adulthood. The achievement of positive health, a status of full physical, mental and social well-being is assumed to be the right of each individual, beginning as early as the prenatal period (WHO).

Fitness activities in the school setting have important individual, societal and economic implication. It is often stated that a child's mind is a terrible thing to waste. This is true, but it is also terrible to waste the other 90% of the child's body.

References

- [1] Takken T, J Van Der Net, Kuis W, Helders PJM (2003).Ann Rheum Dis 2003;62:885-889.
- [2] Van der Horst K , Paw M , Twisk JWR , Van Mechelen W (2007). A brief review on correlations of physical activity and sedentariness in youth. Med Sci Sports Exerc.2007;38(8):1241-50.
- [3] www.businessdictionary.com
- [4] www.livestrong.com
- [5] Bruce G, Guy SP, Nancy M O'Hara , Blair SN , Russell RP. (1988). Health – related Physical fitness in Childhood.Status and Recommendations.Annual review Public health 9: 403 – 25.
- [6] Amusa LO, Goon DT, Ame AK, Toriola AL (2011). Health – related Physical Fitness among rural primary school children in Tshannda, South Africa. Scientific research and essays, vol. 6.(22) pp 4665 – 4680 .ISSN 1992 – 2248.
- [7] Ortega FB, Ruiz JR, Castillo MJ, Sjostrom M (2008). Physical fitness in childhood and adolescence: a powerful marker of health. Int. J. Obes., 32: 1-11.
- [8] Howley ET (2001). Type of activity; resistance, aerobic and leisure verses occupational physical activity. Med Sci Sports Exerc, 33. 364 – 369.
- [9] Rogol A D, Pamela A Clark and James N Roemmich (2000). Growth and pubertal development in children and adolescents : effect of diet and physical activity. American Journal Of Clinical Nutrition Vol. 72 , No. 2 , 521s – 528s
- [10] SeejaTP , KS Kumari, (2009). Augmenting BMI and waist – height ratio for establishing more efficient obesity percentiles among school – going children. Indian Journal Of Community Medicine 2009 : 34 ,Issue 2 pp 135 – 139.
- [11] Shabana Tharkar and Vijay Viswanathan (2009). Impact of socioeconomic status on prevalence of overweight and obesity among children and adolescents in urban India. The open obesity Journal 1, 9 – 14.ISSN 1876 – 8237 / 09 .
- [12] Brambilla P, Bedogni G, Heo M, et al. Waist circumference-to-height ratio predicts adiposity better than body mass index in children and adolescents. Int J Obes (Lond) 2013;37:943–6. doi:10.1038/ijo.2013.32.
- [13] Anthony JG, Stewart BH, Joel G et al (2007) Overweight among children and adolescents in a native Canadian community: Prevalence and associated factors. Am J Clin Nutr 2000;71:693 – 700.
- [14] Pateric K,Calfas GJ, Zabinski MF, Cell J (2004).Diet, physical activity and secondary behaviors as risk factors for overweight in adolescence. Arch PediatrAdolesc 2004;158:385-90.
- [15] Merchant AT, Deghan M, Cook DB, Anand SS (2007). Diet, physical activity and adiposity in children in poor and rich neighbourhoods:A cross – sectional comparison. Nutr J 2007.
- [16] Francisco BO, Jonatan RR, Micheal S (2007) Physical activity, overweight and central adiposity in Swedish children and adolescents: the European youth heart study. Int J Behav Nutr Phys Act 2007;4:61.
- [17] Bundy AC, Naughton G, Tranter P, Wyver S, Baur L, Schiller W, Bauman A, Engelen L,Luckett T, Niehues A, StewartG,Jessup G, Brentnall J (2011). The Sydney playground project : Popping the bubblewrap – unleashing the power of play : a cluster randomized controlled trial of a primary school playground based intervention aiming to increasing children's physical activity and social skills. BMC Public Health 2011;11:680. doi : 10.1186/1471 – 2458 – 11 – 680
- [18] Supreet Kaur, HPS Sachdev, SN Dwivedi, R. Lakshmy, Umesh Kapil (2008) Prevalence of overweight and obesity amongst school children in Delhi, India. Asia Pac. J Clin Nutr 2008;17(4):592-596.
- [19] Blake Hagen, www.livestrong.com June 2010

International Journal of Engineering Science Invention (IJESI) is UGC approved Journal with Sl. No. 3822, Journal no. 43302.

* Manjusha Atul Bhakay " Impact of Lifestyle on the Health Related Physical Fitness of Children 7 – 9 Years Attending International Schools. " International Journal of Engineering Science Invention (IJESI) 6.8 (2017): 26-37