

# Physical Fitness and Growth Performance of Menstruating Girls Belonging To Upper and Lower Socio-economic Status

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## Abstract

The present investigation has been conducted on 327 subjects ranging in age from 11-15 years attending various schools of Patiala (Punjab) to evaluate the effect of socio-economic status on the physical fitness and growth performance of menstruating girls. Body weight, height, five skinfolds (biceps, triceps, subscapular, suprailiac and calf) and five physical fitness tests of AAHPER Youth Fitness test battery were measured. The information of their socio-economic status including their father's education, profession and the monthly income was collected and the subjects were divided into upper and lower socio-economic status (SES). A total of 224 subjects were included for upper and 103 were for lower socio-economic group. The retrospective method was used for collecting the information regarding their menarcheal status. Upper SES girls run significantly faster than the lower SES girls in shuttle run and 50m dash. The upper socio-economic girls perform better and jump longer distance in standing broad jump than the lower SES group. Only in case of flexed arm hang the lower SES girls could perform this feat for a significantly longer duration than the upper SES counterparts. The upper SES girls are significantly taller and heavier than their lower SES counterparts. The upper SES girls have shown significantly greater thickness of (biceps, triceps, subscapular, suprailiac and calf) skinfolds. The upper SES girls have significantly greater amount of body fat than their lower SES counterparts who in turn have significantly greater amount of LBM. The BMI is significantly greater in upper SES girls than lower SES girls.

**Key Words: Socio-economic Status, Body Fat, Physical Fitness, Body Mass Index**

## Introduction

Physical fitness is generally considered to encompass three components viz. strength, stamina and flexibility. *World Health Organization (1947)* defines physical fitness as “a state of complete physical, mental and social well being...not merely the absence of disease”. The growth performance of children is influenced by a number of factors including the social stratification & family environment. The findings throughout the World have indicated a better growth performance of children belonging to upper social strata (*Bogin & Macvean 1981; Singh et al. 1987; Eveleth & Tanner 1990 and Prista et al. 1997*). The reason for the better growth performance of higher social strata

children include better family environment, good and nutritious diet, better hygiene, availability of the recreation and leisure activities. Studies on this aspect reveal that the children from affluent families tend to be heavier and taller in contrast to those from non-affluent families. But during adolescence, girls from lower SES from developed countries tend to be heavier than those belonging to upper SES (*Malina et al. 1985*). This change is reflected through their preferences for slenderness in the girls' belonging to upper SES families. It has also found that the larger families tend to put pressure on the growth of children.

Similarly the higher social class children generally performed better in

physical fitness tests. In a study by *Kaur (1982)* a comparison of physical fitness of public school students versus Govt. school students indicated that the former had better physical fitness. *Mokha et al. (1998)* & *Eiben et al. (2005)* concluded that the urban girls were slightly taller and heavier than the rural counterparts whereas the running ability was more in rural girls as compared to the urban girls. These differences between urban and rural girls decreased with increasing age. The urban children of both the sexes experienced puberty spurt one year earlier than their rural counterparts. The urban boys and rural girls were having more subcutaneous fat than rural boys and urban girls. The performance in all the strength tests was better in boys. In early childhood the performance of boys and girls were nearly same. Thereafter the performance in boys increased gradually but in girls however, it increased slower and at a decreasing tempo and became stable at a lower level with their age at menarche. The urban children performed better than their rural counterparts (*Eiben et al. 2005*). It is also revealed by *Mokha et al. (2006)* and *Kaul & Corrunccine (1985)* that the age at menarche was delayed in rural girls as compared to urban girls.

Numerous authors have studied the effect of socio-economic factors and urbanization on the physical growth in height and weight and demonstrated that the upper SES children grow favorably than the lower SES class children (*Rona, 1981; Singh et al., 1987; Eveleth & Tanner, 1990; Obeidallah et al., 2001; Singh, 2002; Junqueira Do Lago et al., 2003; Eiben & Mascie-Taylor, 2004 and Walker et al., 2006*). It has universally been found that the children belonging to upper SES grow faster than the lower SES and are taller & heavier also. The effect of urbanization has also indicated a favorable growth of children of urban areas. The present investigation has been conducted to

evaluate the effect of socio-economic status on the physical fitness and growth performance of menstruating girls.

## Material and Methods

To compare the menstruating girls from upper and lower socio-economic status the present study was conducted on 327 subjects ranging in age from 11-15 years attending various schools of Patiala (Punjab). Body weight, height and skinfolds (biceps, triceps, subscapular, suprailiac and calf) were taken according to the standard technique of *Weiner and Lourie (1969)*. Five physical fitness tests according to *AAHPER (1976)* Youth Fitness test battery were taken to examine the physical fitness of the girls. The information of their socio-economic status including their father's education, profession and the monthly income was collected. The subjects were divided into upper and lower socio-economic status on the basis of modified standard given by *Kuppuswami (1981)*. A total of 224 subjects were included for upper and 103 were for lower socio-economic group. The retrospective method was used for collecting the information regarding their menarcheal status. The percentage of fat was calculated by using the equation of *Slaughter et al. (1988)*.

## Results

**Table 1: Physical fitness parameters in menstruating girls belonging to upper and lower socio-economic status.**

VARIABLES	Upper SES Group		Lower SES Group		DIF	t-test
	Mean	SD	Mean	SD		
Flexed Arm Hang (sec)	8.71	9.95	11.04	9.73	2.33	1.98*
Shuttle Run 10x4 yards (sec)	20.31	3.81	21.27	3.04	0.96	2.25*
Standing Broad Jump (cm)	166.2	58.9	136.9	36.8	29.3	4.80***
50m dash (sec)	14.30	4.57	15.06	4.82	0.76	2.47*
600m run/walk (sec)	365.4	57.4	369.9	60.1	4.5	0.65

\*  $p < 0.05$ , \*\*\*  $p < 0.001$

The various physical fitness parameters of menstruating girls from upper and lower social strata have been shown in table 1. Upper SES girls run significantly faster than the lower SES girls in shuttle run and 50m dash. The upper SES girls perform better and jump longer distance in standing broad jump than the lower SES group. Only in the case of flexed arm hang the lower SES girls could perform this feat for a significantly longer duration than their upper SES counterparts.

**Table 2: Anthropometric characteristics of menstruating girls belonging to upper and lower socio-economic status.**

VARIABLES	Upper SES Group		Lower SES Group		DIF	t-test
	Mean	SD	Mean	SD		
Weight (kg)	43.62	7.67	40.62	5.71	3.00	3.56***
Height (cm)	152.6	6.18	151.2	5.29	1.4	2.00*
Biceps (mm)	6.99	4.25	4.95	1.94	2.04	4.64***
Triceps (mm)	11.70	5.51	8.51	2.84	3.19	5.55***
Subscapular (mm)	14.08	5.08	12.14	4.31	1.94	3.36**
Suprailiac (mm)	10.72	3.97	8.90	2.82	1.82	4.19***
Calf (mm)	14.29	5.02	12.00	3.58	2.29	4.17***

\* p<0.05, \*\*\* p <0.001

**Table 3: Percent fat, %LBM, BMI, absolute fat and absolute LBM in menstruating girls belonging to upper and lower socio-economic status.**

VARIABLES	Upper SES Group		Lower SES Group		DIF	t value
	Mean	SD	Mean	SD		
% Fat	22.07	5.38	18.91	4.46	3.16	5.20***
% LBM	77.93	5.38	81.09	4.46	3.16	5.20***
BMI	18.68	2.83	17.69	2.23	0.99	3.10**
Fat, kg	9.89	3.82	7.80	2.70	2.09	5.00***
LBM, kg	33.67	4.58	32.60	3.27	1.07	2.13*

\*p<0.05, \*\*p <0.01 \*\*\* p <0.001

Table 2 shows the mean values of height, weight & five skinfold measurement of menstruating girls belonging to upper and lower SES. The upper SES girls are significantly taller and

heavier than their lower SES counterparts. The upper SES girls have shown significantly greater thickness of (biceps, triceps, subscapular, suprailiac and calf) skinfolds.

The upper SES girls have significantly greater amount of body fat than their lower SES counterparts who in turn have significantly greater amount of LBM. The BMI is significantly greater in upper SES girls than lower SES girls (table 3).

## Discussion

The present study was conducted to test the hypothesis that the menstruating girls from upper and lower socio-economic status have similar physical fitness and body composition. But the results of this study reject this hypothesis because the girls belonging to upper socio-economic status have greater values of almost all the physical fitness parameters and all the anthropometric measurements. *Bhatnagar et al. (1987) & Kumar (1989)* reported that the girls belonging to upper socio-economic status girls mature earlier as compared to lower socio-economic status girls. They attributed it to better living conditions, nutritional status and medical facilities available to children of upper SES group. The effect of socio-economic conditions was reflected almost equally in all the parameters of growth at most of the ages. The subjects from higher SES were advanced in all the maturity markers. They had more percentage of body fat, LBM, biacromial diameter, hand and calf circumferences. Higher

SES group of children were taller, heavier and found to be ahead in each developmental stage of facial hair, dental age and in secondary sex character age. However the subjects' from lower SES group have more sitting height vis-à-vis stature as compared to their counterparts from upper SES.

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