

₹ 100

ISSN - 2249-555X

Volume : 1 Issue : 4 January 2012



Journal for All Subjects

www.ijar.in

Listed in International ISSN Directory, Paris.



ISSN - 2249-555X

Indian Journal of Applied Research

Journal for All Subjects

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Age At Menarche In Physically Active And Non Active Urban Girls Of Patiala District

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ABSTRACT

The present study is concentrated to study age at menarche in physically active and non active girls of Patiala district. Total of 320 girls ranging in age from 8 to 16 years were studied. Out of 320 girls, 160 were physically active and 160 were physically non active. The age at menarche was noted by recall method through the use of questionnaire. Height, weight, body fat, haemoglobin (Hb), and 3 day diet recall was also taken. It is observed that age at menarche was delayed by almost an year in physically active girls.

Keywords : Sports, Active Girls, Menarche

Introduction

Menarche, the beginning of menstruation is believed to be influenced by a number of factors including body composition, socioeconomic status, physical activity and nutritional status. It is studied that age at menarche is greatly affected by participation in sports. Age at menarche is viewed as an excellent physiological marker of adolescent maturation. The relationship of the growth spurt in height and weight to menarche has long been studied. Frisch and Revelle (1970) and Frisch and mc Arthur (1974) proposed a critical weight and weight gain for the onset of menarche. Several other studies also support the weight hypothesis (Lin-Su k et al,(2002), Deo and Gattorgi (2004). It has been studied that physically active girls tend to mature later which can be due to "inherited physique" as mentioned by Malina (1983) or due to a negative energy balance (Warren 1980)

While age at menarche has been reported in several parts of the world including the rural and urban parts of Punjab, there is a paucity of information in the field of physically active and non active girls. This study was therefore carried out to find out the effect of physical activity on the age at menarche. With above understanding the present study aims to investigate the mean age at menarche among physically active and non active girls in urban school going girls of Patiala.

Materials and Methods

The study was conducted to evaluate the age at menarche of 320 school going girls ranging in age from 8-16 years from various schools of Patiala city during the period of Nov 2009-april 2010. Out of 320 girls 160 were actively involved in various sports and other 160 were not involved in sports. The grouping was done in 9 groups with a difference of one year in them. The age at menarche was calculated using retrospective method that is recall method through questionnaire. Height, weight, body fat %, Haemoglobin (Hb) and dietary intake was also calculated for each subject.

Results and Discussion

Table 1. Illustrates the comparison of height, weight, body fat percentage and BMI of physically active and non active girls.

It has been noticed from the table that physically active girls are taller than physically non-active girl. A significant difference between the heights of physically active and non active girls has been observed. However the difference is not significant in ages 15 to 16.

It has been noticed from the Table.1 that physically active girls are heavier than physically non-active girl. However the difference is statistically significant only at the ages of 11 and 14. The difference in mean weight at age 14 is 8 kg. The table also illustrates the difference between BMI of physically active and non active girls. Banerjee et al (2007) found that BMI is not correlated with age at menarche.

Table 1 - Comparison of Height, Weight, BMI and Body Fat Percentage of physically active and non active girls

* PA - Physically Active, PNA - Physically Non Active

Age Group	Height (cm)			Weight (Kg)			BMI			Body fat %		
	PA*	PNA*	t value	PA	PNA	t value	PA	PNA	t value	PA	PNA	t value
8.5 - 9.49	131.33 +10.86	123.8 +5.63	2.76 99.13	27.05 +4.64	24.7 +4.85	1.55	15.63 +1.96	15.9 +2.38	.39 30	11.92 +7.13	12.68 +1.99	.45 34
9.5 - 10.49	135.33 +7.57	131.82 +4.86	1.74 91.09	25.7 +2.38	25.2 +1.56	0.62	10.67 +1.11	15.28 +1.65	12.50 100	15.13 +6.67	17.31 +1.46	6.09
10.5 - 11.49	144.2 +4.97	138.4 +5.41	3.53 99.89	36.06 +7.51	27.8 +5.09	4.07	17.18 +2.76	14.38 +1.75	3.85 99.96	19.74 +5.78	19.18 +1.85	.41
11.5 - 12.49	143.75 +6.65	140.17 +9.10	1.40 83	34.3 +6.22	31.5 +5.01	1.56	10.975 +5.6	16.09 +1.07	19.29 100	17.21 +4.81	22.02 +5.59	2.91
12.5 - 13.49	149 +5.73	148.91 +7.45	3.51 99.8	40.31 +9.15	36.9 +7.90	1.26	18.12 +4.91	16.49 +3.56	1.27 78.86	22.91 +4.39	23.30 +6.36	.23
13.5 - 14.49	154.67 +4.85	149.4 +10.58	2.01 94.8	45.8 +8.19	37.4 +7.73	3.3	19.62 +2.55	16.92 +1.41	4.16 99.9	23.36 +2.42	21.97 +6.02	.96
14.5 - 15.49	153.1 +6.08	152.5 +6.42	.30 23	42.99 +6.60	42.96 +3.45	.49 37.2	18.19 +2.19	18.26 +2.05	.24 18.77	23.11 +3.26	25.8 +4.52	2.16
15.5 - 16.49	155 +1.40	155.7 +3.92	.75 54	44.97 +2.66	42.35 +5.23	1.99 94.7	18.6 +1.87	17.31 +1.89	2.13 96	22.95 +1.42	26.31 +5.40	

The fat percentage of physically active girls was less than the physically non active girls, however the difference was statistically significant only at the ages of 10, 12, 14 and 15. The low fat percentage in physically active girls has also been reported by Warren(1983) there is an imbalance in energy intake and energy output of girls which create a negative energy balance.

Table 2 - Enlists the mean age at menarche of physically active and non active girls . It is observed that the mean age at menarche in physically active girls is less than physically non active girls in all age groups. The mean age at menarche in the combined sample of active girls is 13.6 and that of non active girls is 12.7. the menarche is delayed by almost an year in physically active girls. Similar results were reported by Sidhu and Grewal(1980)

Table 2 - Mean age at menarche of physically active and non active girls

Age	Particular - age at menarche			
	Physically active urban		Physically Non active urban	
	Mean	SD	Mean	SD
8.5-9.5				
9.5-10.5				
10.5-11.5				
11.5-12.5			11.27	±.23
12.5-13.5	12.29	+ .66	12.2	+ .32
13.5-14.5	13.39	+ .38	13.2	+ .26
14.5-15.5	14.039	+ .29	13.475	+ .60
15.5-16.5	14.159	+ .34	13.675	+ .88

Table 3 - Enlists the number of girls that attain menarche at a particular age. It has been found that number of physically active girls attaining menarche at early ages were less as compared to physically non active girls .No physically active girl attain menarche below 12 years of age. It is in accordance with Moisan et al (1991) and Cavadini et al (2000)

Table 3 - Number of girls attaining menarche at a particular age.

Age	Particular - menarcheal age	
	Physically active urban 62/160	Physically Non active urban 66/160
Less than 10	0	0
10-11	0	0
11-12	0	12
12-13	6	16
13-14	24	28
14-15	24	10
More than 15	8	
Lowest age	11	11
Highest age	15.27	14.8

Table 4 - Shows the correlation between age at menarche and factors affecting it like BMI, body fat percentage and mothers age at menarche .it has been found that age at menarche is genetically determined as there are high correlation values between age at menarche and mothers age at menarche. It has also been found that there are secular trends which is in accordance with the results of Kolaran et al(2005),Rokade and mane(2009) and Banerjee et al(2010).

Table 4 - Correlation between age at menarche and other factors

	PNA	PA
12-13		
Fat %age	.883022677	
Mother's Age At Menarche	.966282239	
BMI	.525295	
13-14		
Fat %age	.242436	.94584817
Mother's Age At Menarche	.947365917	.993372494
BMI	.173918	.871023
14-15		
Fat %age	.818635	.94161224
Mother's Age At Menarche	.959247762	.95386836
BMI	.937227413	.945817
15-16		
Fat %age	.72361195	.96912902
Mother's Age At Menarche	.993514358	.951615108
BMI	.911904	.895934

Conclusion

It has been found that the age at menarche is delayed by a year in physically active girls than in physically non active girls. Age at menarche is affected by activity performed, BMI, fat percentage and mother's age at menarche.

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