

Original Article

Health and Nutritional Profile of School going Adolescents in Surat city

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Abstract:

Background: As the health remains a neglected issue in majority of times by school going adolescents and the data on prevalence of childhood obesity and blood pressure from India are scanty.

Objective: Present study was undertaken with the first objective to assess the nutritional status of school going adolescents by anthropometric measurements and to correlate their health status with their nutritional status. The second objective was to measure their blood pressure to look for the prevalence of hypertension among them.

Methodology: A cross sectional study was carried out which included anthropometric and blood pressure measurements among school going adolescents.

Data entry and analysis: Data was entered in Microsoft excel and analysis was done by using EPI 6 software.

Results: In all, 203 students from standard 7th to 12th in the age group of 11 to 17 years were examined. Out of total 203 students examined, 122 (60%) were boys and 81(40%) were girls. Out of total 203 children 105 (51%) were underweight, 10(5%) were overweight. It was found that 16 children (7.88%) were having hypertension.

Recommendation: There is a need to screen the school adolescents for parameters of overweight/obesity and hypertension, symptomatic or otherwise.

Keywords to index: Adolescent, Anthropometry, Hypertension

Introduction:

Adolescence is the period of psychological and social transition from [childhood](#) to adulthood. The word is derived from the [Latin](#) verb *adolescere* meaning "to grow up". Because biological and psychosocial growth and development are dynamic throughout adolescence, it is important that teenagers be screened for adequacy of nutritional and health status each

year. Over the past two decades, studies have also shown that "essential" hypertension (i.e., hypertension of unknown etiology); can be found among children and adolescents. These particular blood pressure (BP) patterns show a strong correlation to adulthood hypertension.¹ Although the prevalence of hypertension during childhood is lower than that seen in adulthood, this condition is not rare in adolescent, thus stressing the importance of evaluating BP.² Obesity is a main effector of BP in children. Hypertension, as well as dyslipidemia, type 2 diabetes, orthopedic problems, sleep apnea, and gall bladder disease are considered as complications associated with obesity in children.

As the health remains the neglected issue majority times by the school going adolescents and the data on prevalence of childhood obesity and blood pressure from India, which is also undergoing an epidemiological transition, is scant, the study was planned.

Objectives:

The present study was undertaken in an urban area of Surat with the objective to study the health and nutritional status of school going adolescents by anthropometric measurements and correlate their health status with their nutritional status and to look for the prevalence of high blood pressure among them.

Methodology:

The cross sectional study was carried out in one of the central board school of Surat city in September 2008 with prior permission from principal of the school. Verbal consent from each student was taken prior to their enrollment for the study. Students of class 7th to 12th were included in the study to cover the adolescent group. To get representative sample one division from each 3 divisions of each of the standards was chosen. All students who were present at the time of study of the selected division were enrolled. School students who did not meet with the above

criteria and who denied participation in the study were excluded from the study.

Pretested, pre designed semi-structured proforma was used which included the anthropometric measurements (height, weight, BMI, waist circumference, hip circumference) and blood pressure measurement. As the waist hip ratio is associated with increased risk of metabolic complication, the waist hip ratio was calculated.³ BMI was calculated from height and weight and classification of BMI was applied.⁴ Proforma also included questions regarding any recent health complaints that they were having. Anthropometric and blood pressure measurements were taken by the same set of observers to avoid the inter observer variations. To avoid biological variations in blood pressure measurements three readings were recorded and mean of these three measurements was considered for analysis. All investigators were trained for the methods of measurement to minimize the variation. The participants who got abnormal results were referred to the pediatric O.P.D. New Civil Hospital, Surat with referral slip and the class teacher was also informed regarding the health status of the children. Data entry was done in Microsoft Excel and analyzed with the help of EPI 6.

Observations and discussion:

As it was decided to include all present students of selected divisions of class 7th to 12th, accordingly total 203 children were included in the study, out of them 122(60.09%) were boys and 81(39.91%) were girls.

Table1: Age wise distribution of school adolescents

Age group	Boys	Girls	Total
11-12	23	24	47
13-14	43	26	69
15-16	44	25	69
= 17	12	6	18
Total	122	81(39.91%)	203(100%)

Table 1 shows age wise distribution of adolescents. Out of total 203 study participants 105 (51.72%) were underweight while 10 were overweight (4.92%). The prevalence of obesity

was 7.4 % in a study conducted by Kapil U et al among affluent school children in Delhi.⁵

Table 2: Height and weight distribution of school adolescents

	Boys	Girls	Total
Mean Height(m)	1.62± 0.113	1.54± 0.103	1.59± 0.112
Mean Weight(kg)	49.3± 11.15	46.79± 10.82	48.3± 11.15

As mentioned in table 2, mean height of boys was 1.62 m and that of girls was 1.54 m while mean weight was 49.3kg and 46.79kg for boys and girls respectively.

Table3: Distribution of school adolescents according to waist hip ratio:

Sex	Waist hip ratio	Number of children
Boys	>1	01(0.81%)
Girls	>0.85	11(13.58%)

Around 13.58% of girls were having waist hip ratio>0.85(p<0.01) as shown in table 3 which is an approximate index of increased intra abdominal fat mass and total body fat. The increase waist/hip ratio was also considered as one of the risk factor for cardio vascular and other metabolic diseases.

Out of these 203 participants, 10 participants (4 boys and 6 girls) had systolic hypertension. It was found that 10 children (4 boys and 6 girls) had diastolic hypertension. Out of them who had these 20 participants, 4 had both systolic as well as diastolic hypertension, so total 16(7.33%) participants were found to be hypertensive.⁶

As the large amount of school going adolescents were found hypertensive in this study in urban area at an early age it, therefore, necessitates the regular screening and tracking of blood pressure among this age group adolescents.

Table 4 classifies hypertensive school adolescents according to weight, which shows that hypertension is significantly associated with higher weight (p<0.05). The cut off point for higher weight was taken according to NCHS standards.

Table4: Distribution of hypertensive school adolescents according to weight:

Weight	Total children	Hypertensive adolescents
Having >95 th percentile weight(NCHS standard)	07	04(57.14%)
Having <95 th percentile weight(NCHS standard)	196	12(6.12%)
Total	203	16(7.88%)

$X^2 = 17.71, p < 0.05$

Table 5 shows that out of total overweight children, 50% had hypertension, and this association was also found to be statistically significant ($p < 0.05$).

Table5: Distribution of hypertensive adolescents according to BMI:

BMI	Total Number of children	Number of hypertensive adolescents
Underweight	105	01(0.95%)
Normal	88	10(11.36%)
Overweight	10	5(50%)

$X^2 = 10.34, p < 0.05$

As mentioned in table 6, when participants were asked to mention any health complaints, it was least reported by overweight children while out of the total health related complaints maximum were reported in underweight children (57.14%).

Table 6: Distribution of school adolescents according to BMI and health related complaints that they have reported:

BMI	Reported health related any complaints
Underweight	20(57.14%)
Normal	14(40%)
Overweight	1(2.86%)
Total health complaints	35(100%)

Out of total 16 hypertensive children, 15 children did not report any of the health related complaints. It reveals that overweight

children though suffer from hypertension do not come out with health related complaints.

Recommendation:

The present study reveals the need of large scale screening among urban school going adolescent. Adolescents are now-a-days facing dual problem of under nutrition as well as over nutrition. Out of 203 children 16 were found to have hypertension which is more significantly associated with overweight. Though 7.88% children had hypertension, large numbers (15 out of 16) of them were asymptomatic. Hypertension is a well-established risk factor for coronary & cerebral atherosclerotic disease in adults. According to the recommendations of the 1996 task force report on BP in children and adolescents, BP measurements should be incorporated into routine pediatric examination of children.¹ Further, the long, steady slow course of it in adults suggests that it perhaps has its origin in childhood but probably goes undetected during this period. School Health Programme (SHP) has to include blood pressure measurement to screen the hypertensive adolescents as early as possible for tracking of blood pressure and better management as large number of asymptomatic adolescents in urban area were found to be hypertensive in our small study. If it is not possible to measure the blood pressure in all the school going adolescents, at least measures should be directed to record the blood pressure and track it in those who are overweight or having high BMI to get maximum yield. As the treatment modalities are available easily, if hypertension is detected early in asymptomatic children it will prevent the complication/s associated with hypertension and give the quality of life to these future assets of our nation. Large scale studies should be planned to look for the actual prevalence of hypertension in Indian children both in rural as well as urban area. Studies in India has shown high prevalence of obesity, hypertension, hypercholesterolemia and high fat diet among adolescents.⁷

Limitation of the study: Because of the time constraint the sample size of the study was small and due to small sample size it was not possible to calculate age or age group wise statistics. The findings of the study can not be generalized as the sample size is small and it is not representation of the urban

Surat. Only selected health and nutritional indicators were studied.

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"How do we create a harmonious society out of so many kinds of people? The key is tolerance -- the one value that is indispensable in creating community.

We must address and master the future together. It can be done if we restore the belief that we share a sense of national community, that we share a common national endeavor. It can be done. "

Barbara Jordan

"World peace, like community peace, does not require that each man love his neighbor - it requires only that they live together with mutual tolerance, submitting their disputes to a just and peaceful **settlement."**

John F. Kennedy