Section: Community Medicine

Original Research Article

PHYSICAL ACTIVITIES, DIETARY PATTERNS AND THEIR DETERMINANTS AMONG ADOLESCENTS IN FIELD PRACTICE AREAS OF A PRIVATE MEDICAL COLLEGE OF UTTAR PRADESH

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ABSTRACT

Background: Adolescence is a important period in which maximum physical, psychological, and behavioral changes take place. Dietary patterns and lifestyle habits during adolescence are risk factors for several nutrition-related non-communicable diseases in adulthood. **Objective:** The objective is to assess the dietary practices, physical activity and their determinants among adolescents. **Materials and Methods:** A cross-sectional study was conducted among the school students of standard VI to XII. A total of 480 students were selected. A self-administered questionnaire was used to collect data. Student's *t*-test was used to compare the mean intakes of energy, protein, and fat. A $P < 0.05$ was taken as statistically significant. **Result:** Overall, the adolescents reported poor dietary intakes; around half (47.7%) of the students reported consumption of fast food on the previous day. Almost half (51.8%) of them had fast foods/junk foods 1–3 times a week. The study also found that 43.9% participants performed moderate to vigorous physical activity daily. **Conclusion:** The study found that a large proportion of adolescents were adopting unhealthy dietary practices and more than half of them were not engaged in physical activity daily. Hence, it is recommended that addressing these risk factors should be given the highest priority and various strategies of prevention should be applied.

INTRODUCTION

Physical inactivity has been recognized as one of the most important risk factors for morbidity worldwide. Rise in physical inactivity in recent time has significant effects on the global population's overall health as well as the incidence of non-communicable diseases in many countries.[1]

Non-communicable diseases have their roots planted in early infancy. For instance, watching TV has been linked to inactivity and obesity in cross-sectional research involving kids, teens, and adults.[2]

Adolescence to early adulthood is marked by increased transmission of developed habits and a lack of physical activity. In developing countries like India, a few studies have linked childhood obesity and overweight to physical inactivity.[3] Asia leads the world in the number of overweight youngsters. There have been reports of prevalence rates ranging from 4% to 30% in various regions of India.[4]

Encouraging childhood physical activity (PA) will undoubtedly lead to increased adult physical activity as well as a decrease in the burden of chronic illnesses and unhealthy lifestyles.[5] Since adolescence is the time when lifestyles are developed and solidified, the formative years of adolescence are significant in the human life cycle. Adolescents establish their own dietary choices and exercise routines at this time, as well as their social connections with peers.[6]

The literature on physical activity has identified environmental factors that influence physical activity, including participation in school and community sports, availability of exercise equipments, perception of one's physical surroundings, time spent outside, opportunities for exercise, and a setting that encourages

overindulgence in food and discourages physical activity.[7]

Age, gender, parents' education and employment, family income, and place of residence are the sociodemographic factors that affect physical activity.[8] Numerous studies have demonstrated that obesity, a poor diet, and inactivity all raise the risk of lifestyle related diseases.[9] Due to pausity of research on eating habits and physical exercise among teenagers in developing countries, the factors influencing teenage physcial activity are not well understood.[10] Therefore, the purpose of this study is to identify specific actions that may be implemented to address risk factors in order to reduce the incidence and prevalence of non-communicable diseases in the adult population.

Objectives

1. To study pattern of physical activities among school going adolescents in field practice areas of a Private Medical College of Uttar Pradesh.
2. To observe the dietary practices among the study participants.
3. To find out the factors affecting physical activities and dietary practices among the study subjects.

MATERIALS AND METHODS

Study design: A cross sectional study was conducted by the department of community medicine of a medical institute of Uttar Pradesh in July, August and September 2024. The study was conducted in the Government and Private schools located in field practice areas of Community Medicine Department, Venkateshwara Institute of Medical Sciences, Gajraula, Uttar Pradesh. The study participants included school going adolscents of 10-19 years of age (6-12 standard classes) of schools located in the catchment area.

Sample size: The sample size was decided by taking into account the following -

Prevalence of physical inactivity in adolescents taken as 50% 8, confidence limt of 95% and absolute error of 5%. The sample size came out to be 400. Assuming a non- response rate of 20%, a total of 480 students (240 urban and 240 rural) were included in the study.

Sampling technique: The schools situated in the rural and urban field practice areas of Community Medicine Department were included in the study. To get proper representation of all the age groups (10-19 years) from each school only one section of each class was taken at random. In case any randomly selected student was not present or not willing to participate, then the next (Roll no.) was included in the sample.

Study Tools

1. The Youth Physical Activity Semi structural questionnaire was used to measure physical activity level. Physical activity which was assessed using this interviewer-administered questionnaire (available at www.mrc-epid.cam.ac.uk), is based on the children's leisure activities study survey and previously prompt volunteers to self-report the mode, frequency and duration of PA and sedentary activities in different domains, including school time and leisure time over the past 7 days. This questionnaire lists specific activities and it collects information related to the frequency and duration of each activity for both on week and week-ends. This questionnaire was adapted by including three extra activities known to be commonly carried out by Indian adolescents.
2. Food frequency questionnaire to assess dietary practices
3. Questionnaire to study the determinants of physical activity and dietary practices

Anthropometric measurements

1. Weight (kg)
2. Height (m)
3. Waist circumference (cm)
4. Hip circumference (cm)
5. Body mass index (BMI)
6. Waist hip ratio

Anthropometric variables included body weight (in kilogram/kg) and height(metre/m); measurement were done according to written standardized procedure. Body weight was measured to the nearest 100g using calibrated portable scales. Measurement were done with minimal clothing and without shoes. Height was measured to the nearest centimetre using calibrated measuring rod while the subject was in a full standing position without shoes. Body mass index (BMI) was calculated as the ratio of weight in kg by the height in square meter age in a reference and plotted by age on a sex specific growth chart to determine a BMI for age percentile.

Overweight was classified as BMI >=85th percentile to <95th percentile for age and sex;

Obesity was classified as BMI>=95th percentile for age and sex.

The study was conducted after obtaining written permission from the principals of the school selected. Informed consent was taken from parents/guardians of the student before conducting the study during parent- teacher meeting in the school. All the questionnaires were translated to Hindi and retranslated to English by experts to ascertain any unacceptable deviation from the original. of the study. They will be assured of utmost confidentiality.

Data analysis: All data was coded and entered into computer in Microsoft excel. Analysis was performed by using SPSS V18.0 statistical software. Data was presented inform of frequency and proportion for categorical variable, mean & standard deviation for continuous variable.

RESULTS

A total of 480 adolscents studying in standard 6-12 were covered during the study.

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Table 1 shows the sociodemographic characteristics of the participants. The mean age of the students was 14 years with a standard deviation of ± 1 year. The frequency of consumption of different food groups as calculated from the FFQ is shown in table 2. Majority 82.1% of the students reported consumption of energy-dense foods/beverages (sweets, junk food, and sweetened beverages) on the previous day with 47.7% students reporting consumption of junk food at least once on the previous day. The food habit of the students as depicted from their weekly food consumption pattern is illustrated in table 3. It was found that 28.2% students skipped breakfast daily and 66.6% of them consumed fast food at least 1 day per week. For 13–15 years age group, the mean energy intake of boys was lower while it was higher than RDA in the girls. Whereas, the mean intake of proteins and fats was lower than the RDA in both boys and girls. For 16–17 years of age group, a significant difference was seen in the intake of protein and fats only which were lower than the RDA as shown in table 4.

Table 1: Sociodemographic characterstics of the participants (n =480)

Sociodemographic characterstics	n (%)
Age	
13	166(34.6)
14	169(35.1)
15	101(21)
16	36(7.5)
17	8(1.8)
Sex	
Male	213(44.4)
Female	267(55.6)
Father's education	
Illietrate	71(14.8)
Upto class X	199(41.5)
XI-XII	107(22.3)
Graduate and above	103(21.4)
Mother's education	
Illietrate	140(29.2)
Upto class X	201(42.0)
XI-XII	78(16.1)
Graduate and above	61(12.7)
Father's occupation	
Govt employee	60(12.5)
Self employed	397(82.7)
Private sector	23(4.8)
Father's occupation	
Housewife	383(79.8)
Govt employee	10(2.0)
Self employed	72(15.1)
Private sector	15(3.1)
Mothly family Income (Rs)	
< 5000	131(27.3)
5001-10000	167(34.8)
10001-16750	62(12.9)
>16750	120(25.0)
Type of family	
Nuclear	308(64.2)
Joint	172(35.8)

Table 2: Food items consumed in the last 24 h (n=480)

Cereal	
Wheat	470(98)
Rice	5(1)
Others	5(1)
Pulses	364(75.8)
Vegetables	
Leafy vegetable	201(41.8)
Others	312(65.1)
Milk and milk products	
Milk	160(33.3)
Curd/paneer	24(5.0)
Fruits	375(78.2)
Beverages	
Tea	250(52.1)
Soft drinks	20(4.2)
Sweets	235(49)
Junk food	229()47.7

Table 3: Weekly consumption of breakfast, vegetables, fruits and fast foods (n=480)

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	Never n (%)	1-3 times a day	4-6 times a day	Everyday
Breakfast	135 (28.2)	44(9)	137(28.6)	164(34.2)
Vegetables	0(0)	68(13.9)	270(56.3)	142(29.8)
Fruits	4(0.8)	158(32.9)	151(31.4)	167(34.9)
Fast food	161 (33.5)	249(51.8)	36(7.5)	34(7.3)

Table 4: Comparison of mean intake of energy, protein, and fats with the RDA (n=480)

Age group			Mean + SD	RDA	Mean difference	P value
13-15 years	Energy	Boys	2684+56.7	2750	-66	0.029
		Girls	2398+534.2	2330	68.4	0.009
	Protein	Boys	52.4+11.4	54.3	-1.9	0.003
		Girls	50.9+13.8	55.5	-4.6	0.00
	Fats	Boys	39.8+12.3	45	-5.2	0.00
		Girls	36.0+11.9	40	-4.0	0.00
16-17 years	Energy	Boys	2895+787.1	3020	-125.0	0.426
		Girls	2341+575.8	2440	-98.8	0.222
	Protein	Boys	54.6+20.4	61.5	-6.9	0.101
		Girls	48.1+14.5	55.5	-7.4	0.001
	Fats	Boys	40.9+13.4	50	-9.1	0.002
		Girls	35.7+12.3	45	-9.3	0.00

A total of 211 (43.9%) participants performed moderate-to-vigorous physical activities daily. Furthermore, 237 (49.5%) students spent 2–3 h in doing sedentary work such as watching TV/reading/doing homework/chatting. Regarding weight, 145 (30.2%) were found to be overweight; 389 (81.0%) students perceived themselves to be of normal weight, and 65 (13.6%) to be overweight. Among the overweight students, 88 (61.0%) of them were girls. Female students were found to skip breakfast more as compared to males (P = 0.023) while males were found to be more involved in vigorous physical activity than females (P = 0.000).

DISCUSSION

The mean age of the respondents in this study was 14 ± 1.0 years and 55.6% were females. Overall, the adolescents reported poor dietary intakes; 82.1% of the students reported consumption of energy-dense foods and energy-dense beverages on the previous day. 70% of the school-going adolescents in Kolkata had reported consumption of energy-dense snacks in a study conducted by Rathi et al.[11] Another study by Kotecha et al,[12] also showed a similar dietary pattern, where more than half of the students reported consumption of energy-dense snacks. These findings highlight the consequence of food globalization where the consumption of energy-dense and nutrient-poor foods and sugar-sweetened beverages has increased substantially. Regarding the pattern of taking breakfast, almost one-third (34.2%) of the adolescents had a history of taking breakfast daily. A similar finding was shown in a study done in Raichur,[13] where only one-third of the students had taken breakfast regularly. Nearly half 45.2% of the adolescents in the present study had shown engaging more than 2 h in sedentary habits. A similar observation was seen in the study conducted by Bachani et al.[2] Regarding the perception of own body weight, 81% of the adolescents perceived themselves to be of normal weight and 13.7% perceived to be overweight which is similar to the study conducted by Kumar et al,[14] HAlf 51.8% of the students ate fast foods/junk foods one-three times a week. Similar results were found in the study conducted in Belagavi,[15] and by Sarkar et al.[16]

The overall prevalence of overweight was found to be 30.3% in the present study out of which 61% were girls. Almost similar finding was observed in other studies conducted in India,[17] where the prevalence was 23%. In this study, the prevalence of overweight was more in girls 33.2% as compared to boys 26.5%. Similarly, in the studies by Saikia et al,[17] Kumar et al,[14] adolescent girls were found to be more overweight than boys. The influence of gender on overweight can be attributed to hormonal changes at puberty and the development of secondary sexual characteristics resulting in fat accumulation. The present study also found that around 43.9% of the students were involved in doing moderate-vigorous physical activity daily. This is consistent with the findings of Saikia et al,[17] and Choudhary et al,[18] Males were found to be engaged in vigorous physical activity more than females (P = 0.000). A similar association was found in studies conducted by Saikia et al,[17] The factors responsible for this could be school environment, availability and accessibility of playgrounds, preference of girls to indoor games, social responsibility as a homemaker during teenage years in developing countries like India, self-perception of girls of feeling less compatible to physical activity as compared to males. Girls were found to skip breakfast more as compared to boys in the present study (69.2% vs. 61.7%, P = 0.023).

Limitation: The use of self-administered FFQ could pose certain limitations as a dietary recall is dependent on the memory, literacy, and numerical skills of the respondent. Twenty-four-hours recall method for the dietary assessment itself restricts the representation of dietary cycle of the participants. In addition, the information on dietary practices were self-reported by the students and not based on observation and may be influenced by what is ideal as compared to the facts. The self-reported nature of

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physical activity by the participants has limitations of under/over reporting and socially desirable bias.

CONCLUSION

The study found that a considerable proportion of adolescents was adopting unhealthy dietary practices and more than half of them were not engaged in physical activity daily. Gender difference in being overweight and in doing vigorous physical activity was seen. The present study found the existence of two major behavioral risk factors for NCDs: Unhealthy diet and physical inactivity among the school-going adolescents. Hence, it is recommended that addressing these risk factors should be given the highest priority and various strategies of primordial, primary, and secondary prevention should be applied to control further increases in these risk factors.

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