Life's Crucial Transition & Leads for Comprehensive Trajectory: Adolescents survey at physiological stages for prudent policies and refinements for practice

Sunil Jain (sunil_jain700@rediff.com)
Command Hospital (NC) https://orcid.org/0000-0002-3935-9243
Abhishek Mallick
Command Hospital (CC)
Rajeev Kumar Thapar
Command Hospital (CC)

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Abstract

Background Adolescent health information within new global health initiatives is advocated. Global School-based Student Health Survey (GSHS) is among young people aged 13 to17 years. Early preventive and health promotion actions can be beneficial. With the objective of finding out the current health behaviors and protective factors at different physiological stages of adolescence this study was carried out. Methods School-based survey using self-administered questionnaire of adolescents studying in an Army Public School. The study parameters were Dietary behaviours, Hygienic practices, Mental health, Physical activity, and Protective factors. A total of 1232 adolescents were surveyed. Early adolescence (10-13years) participants were 760 and middle adolescence (14-17 years) were 472. Overall male: female ratio was 1.819: 1. Results The study findings reveal interesting trends. There is disparity between BMI findings and effort direction for weight. There is a sharp rise in number of girls making efforts to lose weight from early adolescence to middle adolescence (27.8% and 40.7% respectively). Hygienic practices are marginally short of 100%. Worry causing inability to sleep at night most of the times or always is reported by 9.2% -18.7%. There is sharp rise in number of girls feeling this from early to middle adolescence (9.8% to 18.7%). Adolescents spending three or more hours per day doing sitting activities are 25.6% - 38.6%. This is rising from early to middle adolescence, and sharply in girls. Protective factors are trending towards positive side. Conclusions Firstly accomplishing the advancements of adolescents' health, the top priorities are (i) Popularizing the importance of ideal BMI (ii) Betterment of mental health for smooth transition across different stages of adolescence & being proactive for preventing worsening (iii) Promoting physical activity early & sustaining efforts, especially amongst adolescent girls. Secondly the 'GSHS Questionnaire' needs to be modified for fruits & vegetable consumption to how many servings/what part of plate and should include questions for details of physical activity likings of the girls.

Background

Adolescence is period of transition & change. Opportunities for prevention and early clinical intervention for smooth transition with tactful strategies are immense. The development of health information systems to support this work has been weak and so far lagged behind those for early childhood and adulthood [1]. A study of adolescents' current trends at progressive physiological stages should have important implications.

With the aim to find the health behaviors and protective factors among adolescents, and for correlation, comparison, & advancements vis-a-vis Global School-based Student Health Survey (GSHS), this study was planned & carried out [2].

At present, there is no internationally agreed set of indicators for adolescent health [1]. Patton et al carried out a synthesis of internationally comparable data, and the indicators incorporated elements from earlier national reports including measures of health and wellbeing, social role transitions, risk and protective factors, and health service system responses. More recently, as per World Health Organization

(WHO) main health issues for adolescents are (i) Early pregnancy and childbirth (ii) Human Immunodeficiency Virus (iii) Other infectious diseases (iv) Mental health (v) Violence (vi) Alcohol & drugs (vii) Injuries (viii) Malnutrition and obesity (ix) Exercise & nutrition (x) Tobacco use (xi) Rights of adolescents [3]. However on the basis of our experience of day-to-day clinical practice of more than two decades, we focused on Dietary behaviors, Hygiene, Mental health, Physical activity, and Protective factors.

Methods

Study design

School-based survey using a self-administered questionnaire to obtain data on young people's health behaviors and protective factors.

The WHO GSHS Questionnaire based survey methodology [4] used with the following modifications (i) The participant's modification- The GSHS is conducted primarily among students aged 13–17 years. However, all adolescents of 10 years and above were included in the present study with following reasoning: Firstly *adolescence period of development is* divided into 3 phases - early (10-13 years), middle (14-17 years), and late adolescence (18-21 years), each marked by a characteristic set of biologic, cognitive, and psychosocial milestones [5]. Secondly early action at an early age should be fruitful. (ii) The Core Questionnaire Modules modifications- part of the '2006 India, Central Board of Secondary Education (CBSE) GSHS Questionnaire' was used, the most clinically relevant ones. These were Dietary behaviors, Hygiene, Mental health, Physical activity, and Protective factors.

Participants

Adolescents studying in an Army Public School (APS).

Sample size

The results of the 2007 India (CBSE) GSHS vary from 2.6% to 45.6% of adolescents for the Dietary behaviors and overweight, Hygiene, Mental health, Physical activity, and Protective factors [6]. Taking the average of this (24.1%), the sample size calculated was 1260 at an allowable error of 10%. Hence 1260 adolescents were studied.

Sample selection

The participants were from the school classes VI to XII. The classes were randomly selected and all students in selected classes were eligible to participate.

Administration

Survey administrators and coordinators instructed and explained to the student participants the following (i) This survey is about your health and the things you do that may affect your health. The information you give will be used to develop better health programs for young people like yourself. (ii) Do not write your name. The answers you give will be kept confidential. (iii) Answer the questions based on what you really know or do. There are no right or wrong answers. (iv) Completing the survey is voluntary. Your grade or mark in class will not be affected whether or not you answer the questions. If you do not want to answer a question, just leave it blank. (v) Make sure to read every question. Tick mark the answer you feel is the most appropriate according to you & for you.

Data compilation & analysis

This was done including the following data edits (i) Out of range edits: none in the present survey (ii) Multiple Response Edits: if a student selected more than one response for a question, then the question was set to missing for that student (iii) Logical Consistency Edits: none in the present survey (iv) Height, Weight, and Body Mass Index (BMI) Edits: Weight and height measurement is regularly done in APS. The students entered the last measurements. *Height* and *weight* were used to calculate body mass index (BMI). *Height*, *weight*, and *BMI* were edited to ensure that results are plausible before the indicators for underweight, overweight, and obesity are calculated. Biologically Implausible Value Editing was also done. These were none in the present survey. (v) Variable-Level Edits: none in the present survey (vi) Record-Level Edits: Data were checked to ensure that each student had at least 1/3 valid responses once all other edits had been completed. Data were also checked to ensure that there are no cases of too many of the same response successively. Based on these 28 student records were deleted.

If the student did not enter response or multiple responses were entered to a particular question, the percentage result for the question was calculated from the total number of valid responses.

Nutritional status was defined as per BMI for age: (i) overweight >1 standard deviation (SD) (ii) obesity >2 SDs (iii) Underweight <2SDs of the WHO Growth Reference median for age & sex [7].

Results

A total of 1232 adolescents' responses were studied. The demographic profile is given in

Table 1. Adolescents who participated in the study were in the age group 10-17 years. 437 were girls & 795 were boys (male : female ratio 1.819 : 1). Responses to the various questions categorized for guiding action are given in Tables 2-6. For comparison the available results of the last i.e. '2007 Global School - based Student Health Survey - India (CBSE) Survey', from the Public Use Codebook & Factsheet have been given in the right-most column [6,8].

Nutritional status & Dietary behaviors (Table 2)

We categorized the findings Nutritional status classification into Nutritional status classification, Effort direction for weight, and Dietary habits.

The present study findings of overweight & obese adolescents is 2.1% - 10.3% and 0.8% - 3.8% respectively across different adolescence age & sex groups, similar to '2007 India (CBSE) GSHS' findings [6]. Underweight adolescents are 3.4% - 11.6%.

There is a sharp rise in number of girls making efforts to lose weight from early adolescence to middle adolescence (27.8% and 40.7% respectively). Boys trying to gain weight in early adolescence is 23.9% and 26.0% in the middle adolescence group. Also, there is a disparity between the nutritional status findings and the effort direction for weight.

Maximum number of the participants in the present study were eating fruits 2 times per day, and many more than 2 times per day. The vegetables consumption was also better than that of '2007 India (CBSE) GSHS' [8].

The trends in carbonated soft drinks intake reveals a sharp rise in males having these ≥ 1 time per day from 36.3% in early adolescence to 61.8% in middle adolescence.

Hygiene (Table 3)

The findings are that hygienic practices are marginally short of 100%, however cleanliness lacks more. These are better than the '2007 India (CBSE) GSHS' [6,8].

Mental health (Table 4)

We have categorized the characteristics/indicators in two groups, first being 'Feeling unsafe' and second 'Feelings and friendship'. Detailed findings of various aspects of and for mental health of our study are tabulated in Table 4.

The finding of adolescents feeling lonely most of the time or always during the past 12 months in the present study (range 7.8% – 12.2%) is slightly higher than the finding of 8.7% of the ‘2007 India (CBSE) GSHS’ [8].

The findings of the percentage of adolescents who were worried about something so that could not sleep at night most of the time/always during the past 12 months is higher than the ‘2007 India (CBSE) GSHS’ (9.2% - 18.7% vis-a-vis 8%) [8]. Also, there is sharp rise in number of girls feeling the same from early adolescence 9.8% to middle adolescence 18.7% in the present study.

The findings of ‘feeling so sad or hopeless almost every day for two weeks or more in a row that stopped doing your usual activities’ is high (range 27.2% - 28.4%), and slightly higher than the ‘2007 India (CBSE) GSHS’ (25.5%) [8].

No close friends findings in our study is better (range 5.6% - 8.1%). The findings of students in the school being kind and helpful & parents or guardians understanding problems and worries are satisfactory & good.

Physical activity (Table 5)

The proportion of adolescents physically active for a total of at least 60 minutes per day on all 7 days during the past 7 days is higher (range 36.6% - 51.1%) than ‘2007 India (CBSE) GSHS’ finding of 30.2%.

Physical inactivity is trending towards the wrong side with 25.6% - 38.6% of adolescents spending three or more hours per day during a typical or usual day sitting and watching television, playing computer games, talking with friends, or doing other sitting activities as compared to 23.2% in the ‘2007 India (CBSE) GSHS’ [6]. This is rising from early to middle adolescence, and sharply in girls. The findings for girls in physical activity & inactivity are worse as compared to boys in the present survey.

Protective factors (Table 6)

The present study findings are better in all these factors as compared to ‘2007 India (CBSE) GSHS’ [6].

Discussion

Adolescent-health information within new global health initiatives has been advocated, with a recommendation that every country produce a regular report on the health of its adolescents [1].

Nutritional status & Dietary behaviors

Nutritional status both lower and higher than ideal BMI has health effects. Proper health education early can address this with both short & long term implications. The adolescents are image/body conscious and effort direction for weight can be put on right trajectory with teaching them about importance of BMI, and display of ideal values in schools, both in canteens and playgrounds.

The importance of fruits & vegetables is well known. As per the Food guide pyramid the adequacy of vegetables & fruits is defined as 4/5 & 3/4 servings per day for teenage girls/boys respectively. The latest recommendations based on MyPlate emphasize making half the plate vegetables and fruits [9]. Governmental advice on healthy diets is maximizing fruit and vegetable intakes [10]. Majority of the participants indicated that they were taught in school the benefits of eating more fruits and vegetables. This and the findings point towards reinforcing school teaching. Healthy habits will ensure strength in productive years of life rather than obesity with its attendant complications. Also, Beijing authorities have hit upon the novel idea of making teachers responsible for the weight of children in their class to curb rising juvenile obesity [11].

Teaching is for understanding & results. The recommendations for healthy eating of fruits & vegetables are in servings per day / half part of the plate, and the GSHS Questionnaire thus should be modified for proper assessment & advanced for more accuracy. This harmonization can have significant implications in promoting fruits & vegetables and impact health worldwide.

The trends in carbonated soft drinks needs to be suitably addressed. The producers have marketing strategies in place, often misleading the consumers. However the legislation of adding fruit juice and pulp in carbonated drinks, thoughtfully done by visionaries of progress for protecting & promoting health, is a welcome step.

Hygiene

Un-cleanliness has realistic risks & maintaining cleanliness has rewarding results. More efforts can ensure 100% hygienic practices & facilities.

Mental health

Adolescents feeling lonely points to the need for more social interactions. Earlier data from available studies had suggested that loneliness is a painful and widespread problem among adolescents [12]. More recently it has been suggested that as the school is a setting in which adolescents are especially vulnerable to feelings of loneliness, school-based strategies could be particularly useful and wide-reaching [13].

The findings of the adolescents who were worried about something so that could not sleep at night most of the time/always points towards need for early anti-anxiety measures and health education

for smooth transition across adolescent stages. The findings of ‘feeling sad or hopeless’, slightly higher than the ‘2007 India (CBSE) GSHS’ also justify proactive steps. Mental health problems take a particularly big toll in the second decade [14].

Betterment of the aspects that students in the school being kind and helpful & parents or guardians understanding problems and worries can contribute to the best state of mental health.

Categorization of the characteristics/indicators into distinct sub-groups can contribute to focused approach for distinctive policies & practical actions.

Physical activity

The trends for physical activity/inactivity are alarming & the findings of girls worrisome. Physical activity is desirable & efforts in this direction need to be designed. For promoting physical activity amongst girls the GSHS Questionnaire can be advanced with questions for details of activity likings of the girls.

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Protective factors

Adolescents engage in high-risk behaviors that cause significant morbidity and mortality [15]. Thus protective factors are important. The present study findings are better in all these factors as compared to ‘2007 India (CBSE) GSHS’ [6], pointing that the efforts of the WHO and the Centers for Disease Control and Prevention (CDC) of GSHS are bearing fruits and need to be sustained.

The strengths of the study are (i) Findings of early adolescence, as preventive and health promotion actions should be early (ii) Pointing domains showing deterioration across advancing physiological adolescence stages. The limitation of our study is that the participants were from one school, however they were from different parts of the country and frequent postings in the army make them study in different schools regularly.

Conclusions

On the basis of the findings & analysis of these, a few suggestions for policies and promoting healthy practices have emanated. For the ‘GSHS Questionnaire’ suggestions are (i) Advancing for accuracy: harmonizing preaching and practice by modifying the questions on fruits & vegetables consumption to how many servings servings/what part of plate rather than how many times per day. (ii) Advancing for avenues: For promoting physical activity amongst girls the GSHS Questionnaire should include questions for details of, including different types of physical activity likings of the girls.

Our findings of deterioration from early to middle adolescence points towards early action for prevention & a healthy trajectory. The priorities for accomplishing the advancements of our Adolescents health, are (i) Popularizing the importance of & display of values of ideal BMI (ii) Best hygienic practices attainment

by sustaining & strengthening the existing (iii) Betterment of mental health for smooth transition across different stages of adolescence & being proactive for preventing worsening (iv) Early promotion of physical activity and prevention of inactivity, especially amongst adolescent girls (v) Strengthening & sustaining protective factors.

Key Messages

Key messages
u Early & sustained efforts needed for a healthy trajectory, especially in domains showing deterioration across advancing physiological adolescence stages
u Protective factors trending positively, pointing that the efforts of WHO and CDC of GSHS are bearing fruits and need to be sustained.
u GSHS questionnaire needs to be advanced for accuracy & avenues

Abbreviations

GSHS: Global School-based Student Health Survey; yr(s): year(s); BMI: body mass index; SD: standard deviation

Declarations

Ethics approval and consent to participate

Command Hospital (Central Command), Lucknow, India Ethics Committee approved the study. Informed verbal consent from parent or legal guardian of all participants and informed verbal assent from participants of age more than 12 years was obtained. All were informed that this is a survey for developing better health programs, individual's responses will be kept confidential, and participation is voluntary. On the basis of this reasoning only verbal consent and assent was taken and the Institutional ethics committee approved this method.

Consent to publish

Not applicable.

Availability of data and materials

All data generated and analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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Authors' Contributions

SJ conceived and designed the work. SJ, AM, & RKT did the data acquisition, analysis, and its interpretation. SJ, AM, & RKT drafted the manuscript. SJ, AM, & RKT are personally accountable for contributions, accuracy, & integrity of the work. All authors have read and approved the final manuscript.

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Tables

Table 1 Demographic profile

Characteristic	**Number of Adolescents** n=1232					
Sex	Males n = 795			Females n = 437		
Age	Early adolescence (10-13 yr) n = 760		Middle adolescence (14-17 yr) n = 472		Late adolescence (18-21 yr) n = 0	
	Males n = 468	Females n = 292	Males n = 327	Females n = 145	Males n = 0	Females n = 0
Father's rank/occupation	Offrs n = 98		JCO's n = 231	Other ranks n = 763		Civilian n = 140
Part of India	North* n = 215	South* n = 34	East* n = 60	West* n = 39	Central* n = 884	

***** North: J & K, Punjab, Haryana, Rajasthan, Himachal Pradesh, Uttarakhand, Chandigarh, Delhi
South: Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, Andaman & Nicobar, Puducherry, Lakshadweep
East: West Bengal, Orissa, Sikkim, Assam, Arunachal Pradesh, Mizoram, Manipur, Meghalaya, Nagaland, Tripura

West: Gujarat, Maharashtra, Goa, Dadra & Nagar Haveli, Daman & Diu
Central: Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Bihar, Jharkhand

Table 2 Nutritional status & Dietary behaviors

Characteristic			Survey findings				GSHS India 2007 (13-15yrs)
			Early adolescence (10-13 yrs)		Middle adolescence (14-17 yrs)		
			□ n= 468	□ n = 292	□ n = 327	□ n = 145	
Nutritional status classification		Underweight	46/468 (9.8 ± 1.4)	31/292 (10.6 ± 1.8)	38/327 (11.6 ± 1.8)	5/145 (3.4 ± 1.5)	
		Overweight	44/468 (9.4 ± 1.3)	30/292 (10.3 ± 1.8)	31/327 (9.5 ± 1.6)	3/145 (2.1 ± 3.4)	(10.8 ± 2.1)
		Obese	18/468 (3.8 ± 0.9)	7/292 (2.4 ± 0.9)	26/327 (0.8 ± 1.5)	3/145 (2.1 ± 1.2)	(2.1 ± 0.6)
Effort direction for weight		I am not trying to do anything about my weight	194/457 (42.4)	128/288 (44.4)	151/312 (48.3)	63/145 (43.4)	
		Lose weight	117/457 (25.6)	80/288 (27.8)	63/312 (20.2)	59/145 (40.7)	
		Gain weight	109/457 (23.9)	51/288 (17.7)	81/312 (26.0)	14/145 (9.7)	
		Stay the same weight	37/457 (8.1)	29/288(10.1)	17/312 (5.4)	9/145 (6.2)	
Dietary habits	Fruits consumption	≤ 1 times per day	41/461 (8.9)	24/289 (8.3)	27/314 (8.6)	11/145 (7.6)	(72.4)
		2 times per day	305/461 (66.2)	202/289 (69.9)	233/314 (74.2)	118/145 (81.4)	(20.3)
		3 times per day	45/461 (9.8)	29/289 (10.0)	30/314 (9.6)	10/145 (6.9)	(4.0)
		4 times per day	63/461 (13.7)	28/289 (9.7)	19/314 (6.1)	4/145 (2.8)	(1.3)
		≥ 5 times per day	7/461 (1.5)	6/289 (2.1)	5/314 (1.6)	2/145 (1.4)	(1.9)
	Vegetables consumption	≤ 1 times per day	40/463 (8.6)	27/290 (9.3)	28/315 (8.9)	10/145 (6.9)	(36.9)
		2 times per day	190/463 (41.0)	129/290 (44.5)	153/315 (48.6)	71/145 (49.0)	(37.9)
		≥ 3 times per day	233/463 (50.3)	134/290 (46.2)	134/315 (42.5)	64/145 (44.1)	(25.2)
	Taught in school the benefits of eating more fruits and vegetables	Yes	285/468 (60.9)	188/292 (64.4)	197/327 (60.2)	96/145 (66.2)	
		No	125/468 (26.7)	92/292 (31.5)	100/327 (30.6)	38/145 (26.2)	
		I do not know	58/468 (12.4)	12/292 (4.1)	30/327 (9.2)	11/145 (7.6)	
	Carbonated soft drinks	≥ 1 time per day	168/463 (36.3)	101/289 (34.9)	102/165 (61.8)	41/144 (28.5)	

Figures are numbers/total responses & data in brackets is percentage ± Standard error

Table 3 Hygiene

Characteristic		Survey findings				GSHS India 2007 (13-15yrs)
		Early adolescence (10-13 yr)		Middle adolescence (14-17 yr)		
		□ n= 468	□ n = 292	□ n = 327	□ n = 145	
Care of teeth	Did not clean or brush my teeth during the past 30 days	0	0	0	0	(1.3)
	Cleaned or brushed their teeth <1 time per day during the past 30 days	14/462 (3.0)	11/291 (3.8)	5/314 (1.6)	0	(3.3)
	1 time per day	88/462 (19.1)	59/291 (20.3)	103/314 (32.8)	49/144 (34.0)	(40.4)
	≥ 2 times per day	360/462 (77.9)	221/291 (75.9)	206/314 (65.6)	95/144 (66)	(55.1)
Hand Washing	Never or rarely washed their hands before eating during the past 30 days	14/462 (3.0 ± 0.8)	5/291 (1.7 ± 0.8)	8/315 (2.5 ± 0.9)	5/144 (3.5 ± 1.5)	(6.1 ± 1.1)
	Never or rarely washed their hands after using the toilet or latrine during the past 30 days	12/464 (2.6 ± 0.7)	11/292 (3.8 ± 1.1)	7/314 (2.2 ± 0.8)	2/145 (1.4 ± 1.0)	(3.3 ± 0.7)
Toilet facilities	Separate toilets or latrines for boys and girls at school?	428/464 (92.2)	270/291 (92.8)	303/314 (96.5)	141/144 (97.9)	
	Clean toilets or latrines	382/457 (83.6)	244/288 (84.7)	264/313 (84.4)	124/145 (85.5)	
Clean water for drinking	Source at school	394/458 (86.0)	251/289 (86.9)	270/314 (86.0)	128/144 (88.9)	

Figures are numbers/total responses & data in brackets is percentage ± Standard error

Table 4 Mental Health

Characteristic		Survey findings				GSHS India 2007 (13-15yrs)
		Early adolescence (10-13 yr)		Middle adolescence (14-17 yr)		
		□ n= 468	□ n = 292	□ n = 327	□ n = 145	
Feeling unsafe						
Number of days, in the past 30 days, did not go to school because felt that would be unsafe at school or on your way to or from school	0 days	370/461 (80.3)	229/289 (79.2)	280/314 (89.2)	131/145 (90.3)	
	1 day	33/461 (7.2)	30/289 (10.4)	10/314 (3.2)	8/145 (5.5)	
	2 or 3 days	34/461 (7.4)	16/289 (5.5)	10/314 (3.2)	5/145 (3.5)	
	4 or 5 days	7/461 (1.5)	4/289 (1.4)	8/314 (2.5)	1/145 (0.7)	
	≥ 6 days	18/461 (3.9)	10/289 (3.5)	6/314 (1.9)	0/145 (0)	
Feelings and friendships						
Felt lonely during the past 12 months	Never	231/463 (49.9)	134/286 (46.9)	104/314 (33.1)	36/145 (24.8)	(34.8)
	Rarely/ sometimes	198 (42.3)	117/286 (40.9)	177/314 (56.4)	92/145 (63.5)	(56.5)
	Most of the time/always	36/463 (7.8)	35/286 (12.2)	33/314 (10.5)	17/145 (11.7)	(8.7)
Worried about something that you could not sleep at night during the past 12 months	Never	215/458 (46.9)	132/286 (46.2)	135/314 (43.0)	43/144 (29.9)	(35.0)
	Rarely/sometimes	201/458 (43.9)	126/286 (44.1)	145/314 (46.2)	74/144 (51.4)	(57.1)
	Most of the time/always	42/458 (9.2)	28/286 (9.8)	34/314 (10.8)	27/144 (18.7)	(8.0)
Feeling so sad or hopeless almost every day for two weeks or more in a row that you stopped doing your usual activities		131/461 (28.4)	78/287 (27.2)	88/314 (28.0)	41/145 (28.3)	(25.5)
No close friends		36/444 (8.1)	21/277 (7.6)	25/312 (8.0)	8/144 (5.6)	(10.3)
How often did parents or guardians understand his/her problems and worries	Never	44/456 (9.6)	48/290 (16.6)	54/311 (17.4)	24/144 (16.7)	(8.1)
	Rarely/sometimes	71/456 (15.6)	30/290 (10.3)	54/311 (17.4)	25/144 (17.3)	(29.8)
	Most of the times/always	341/456 (74.8)	212/290 (73.1)	203/311 (65.3)	95/144 (66.0)	(62.0)

Figures are numbers/total responses & data in brackets is percentage

Table 5 Physical Activity

Characteristic	Survey findings				GSHS India 2007 (13-15yrs)
	Early adolescence (10-13 yr)		Middle adolescence (14-17 yr)		
	n= 468	n = 292	n = 327	n = 145	
Physically active for a total of at least 60 minutes per day on all 7 days during the past 7 days	228/460 (49.6 ± 2.3)	120/290 (41.4 ± 2.9)	161/315 (51.1 ± 2.8)	53/145 (36.6 ± 4.0)	(30.2 ± 3)
Spent three or more hours per day during a typical or usual day sitting and watching television, playing computer games, talking with friends, or doing other sitting activities	118/461 (25.6 ± 2)	79/291 (27.1 ± 2.6)	100/327 (30.6 ± 2.5)	56/145 (38.6 ± 4.0)	(23.2 ± 2.3)

Figures are numbers/total responses & data in brackets is percentage ± Standard error

Table 6 Protective Factors

Characteristic	Survey findings				GSHS India 2007 (13-15yrs)
	Early adolescence (10-13 yr)		Middle adolescence (14-17 yr)		
	n= 468	n = 292	n = 327	n = 145	
Students who missed classes or school without permission on one or more days during the past 30 days	111/460 (24.1 ± 2)	63/291 (21.6 ± 2.4)	77/314 (24.5 ± 2.4)	27/145 (18.6 ± 3.2)	(26.8 ± 1.8)
Students who reported that most of the students in their school were never or rarely kind and helpful during the past 30 days	83/463 (17.9 ± 1.8)	59/292 (20.2 ± 2.3)	70/314 (22.3 ± 2.3)	28/145 (19.3 ± 3.3)	(41 ± 4.6)
Students whose parents or guardians never or rarely really knew what they were doing with their free time during the past 30 days	44/460 (9.6 ± 1.4)	37/277 (13.4 ± 2.0)	53/321 (16.5 ± 2.1)	25/140 (17.9 ± 3.2)	(27.9 ± 2.7)

Figures are numbers/total responses & data in brackets is percentage ± Standard error