Introduction

Adolescence is a period of transition and change. Opportunities for prevention and early clinical intervention for a 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. A study of adolescents’ current trends at progressive physiological stages should have important implications. Primary care and Family medicine offers an important opportunity for a healthy transition from childhood to adulthood, with sophisticated strategies based on evidence during adolescence. Impactful interventions are imperative at these levels of care for health promotion.

Context: Adolescent health information within new global health initiatives is advocated. Global School-based Student Health Survey (GSHS) is among young people 13 to 17 years. Early prevention and promotion is beneficial. Aim: To find health behaviors and protective factors at different adolescence physiological stages. Settings and Design: School-based survey in an Army Public School. Methods and Materials: The study parameters were dietary behaviors, hygienic practices, mental health, physical activity, and protective factors. A total of 1232 adolescents were surveyed. Early adolescence (10–13 years) participants were 760 and middle adolescence (14–17 years) were 472. Male: female ratio was 1.819:1. Statistical Analysis: Calculation of percentage ± Standard error using standard methods. Results: The study reveals interesting trends. There is a disparity between body mass index (BMI) findings and effort direction for weight. There is a sharp rise in girls making efforts to lose weight from early to middle adolescence (27.8% and 40.7%, respectively). Hygienic practices are marginally short of 100%. Worry causing the inability to sleep at night most of the time or always reported by 9.2–18.7%. There is a sharp rise in the number of girls feeling this from early to middle adolescence (9.8%–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 the positive side. Conclusions: First, for advancements of adolescents’ health, top priorities are (i) Popularizing importance of ideal BMI, (ii) Betterment of mental health for a smooth transition across stages and being proactive for preventing worsening, (iii) Promoting physical activity early and sustaining efforts, especially amongst girls. Second, the ‘GSHS Questionnaire’ needs to be modified for fruits and vegetable consumption to how many servings/what part of plate and include questions for details of physical activity likings of girls.

Keywords: Adolescents, behaviors, diet, mental health, physical activity

Life’s crucial transition and leads for comprehensive trajectory: Adolescents survey at physiological stages for prudent policies and refinements for practice

Sunil Jain, Rajeev K. Thapar

Department of Paediatrics, Command Hospital (Central Command), Lucknow, India

ABSTRACT

Context: Adolescent health information within new global health initiatives is advocated. Global School-based Student Health Survey (GSHS) is among young people 13 to 17 years. Early prevention and promotion is beneficial. Aim: To find health behaviors and protective factors at different adolescence physiological stages. Settings and Design: School-based survey in an Army Public School. Methods and Materials: The study parameters were dietary behaviors, hygienic practices, mental health, physical activity, and protective factors. A total of 1232 adolescents were surveyed. Early adolescence (10–13 years) participants were 760 and middle adolescence (14–17 years) were 472. Male: female ratio was 1.819:1. Statistical Analysis: Calculation of percentage ± Standard error using standard methods. Results: The study reveals interesting trends. There is a disparity between body mass index (BMI) findings and effort direction for weight. There is a sharp rise in girls making efforts to lose weight from early to middle adolescence (27.8% and 40.7%, respectively). Hygienic practices are marginally short of 100%. Worry causing the inability to sleep at night most of the time or always reported by 9.2–18.7%. There is a sharp rise in the number of girls feeling this from early to middle adolescence (9.8%–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 the positive side. Conclusions: First, for advancements of adolescents’ health, top priorities are (i) Popularizing importance of ideal BMI, (ii) Betterment of mental health for a smooth transition across stages and being proactive for preventing worsening, (iii) Promoting physical activity early and sustaining efforts, especially amongst girls. Second, the ‘GSHS Questionnaire’ needs to be modified for fruits and vegetable consumption to how many servings/what part of plate and include questions for details of physical activity likings of girls.

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Original Article

Access this article online

Quick Response Code:
Website: www.jfmpc.com
DOI: 10.4103/jfmpc.jfmpc_339_20

How to cite this article: Jain S, Thapar RK. Life’s crucial transition and leads for comprehensive trajectory: Adolescents survey at physiological stages for prudent policies and refinements for practice. J Family Med Prim Care 2020;9:4648-55.
With the aim to find the health behaviors and protective factors among adolescents, and for correlation, comparison, and advancements vis-a-vis Global School-based Student Health Survey (GSHS), this study was planned and carried out.[3]

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 and drugs, (vii) Injuries, (viii) Malnutrition and obesity, (ix) Exercise and nutrition, (x) Tobacco use, (xi) Rights of adolescents.[9] 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.

Subjects and Methods

Study design
A 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 the following reasoning: First, 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] Second, early action at early age should be fruitful. (ii) The Core Questionnaire Modules modifications: A 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.[8] 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.

Permissions
Institutional Ethics Committee clearance and informed verbal consent of the participants was obtained.

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 and for you.

Data compilation and 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 responses successively. Based on these 28 student records were deleted.

If the student did not enter response or multiple responses were entered into 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 <2 SDs of the WHO Growth Reference median for age and 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. A total of 437 were girls and 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

### 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 |                              |                              |
| Males n=468                     |                              | Females n=292                 |
| Middle adolescence (14-17 yr) n=472 |                              |                              |
| Males n=327                     |                              | Females n=145                 |
| Late adolescence (18-21 yr) n=0 |                              |                              |
| Males n=0                       |                              | Females n=0                   |
| **Father's rank/occupation**    |                              |                              |
| Officers                        | 98                            | JCOs                          | 231 |
| Other ranks                     | 763                           | Civilian                      | n=140 |
| **Part of India**               |                              |                              |
| North*                          | n=215                         | South*                        | n=34 |
| East*                           | n=60                          | West*                         | n=60 |
| Central*                        | n=884                         |                              |      |

*North: J & K, Punjab, Harayana, 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, Maharashitra, Goa, Dadra & Nagar Haveli, Daman & Diu. Central: Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Bihar, Jharkhand

### Table 2: Nutritional status & dietary behaviours

| Characteristic                  | Early adolescence (10-13 yrs) | Middle adolescence (14-17 yrs) | GSHS India 2007 (13-15yrs) |
|--------------------------------|-------------------------------|-------------------------------|-----------------------------|
| **Nutritional status classification** | Underweight                   | Overweight                    | Obese                       |
| Underweight                    | 46/468 (9.8±1.4)              | 30/292 (10.3±1.6)             | 194/457 (42.4)              |
| Overweight                     |                              |                               |                             |
| Obese                          | 44/468 (9.4±1.3)              | 18/468 (3.8±0.9)              | 255/468 (54.8)              |
| Effort direction for weight    | I am not trying to do anything about my weight | I am not trying to do anything about my weight |                             |
| Lose weight                    | 117/457 (25.6)                | 80/288 (27.8)                 | 151/457 (33.4)              |
| Stay the same weight           | 109/457 (23.9)                | 101/288 (35.2)                | 14/457 (3.2)                |
| Fruits consumption             | ≤ 1 times per day             | 2 times per day               | 3 times per day             |
| ≤ 1 times per day              | 41/461 (8.9)                  | 305/461 (66.2)                | 45/461 (9.8)                |
| 2 times per day                | 24/289 (8.3)                  | 202/289 (69.9)                | 29/289 (10.0)               |
| 3 times per day                | 6/129 (8.9)                   | 9.9 (3.6)                     | 4/135 (3.0)                 |
| 4 times per day                | 2/102 (2.0)                   | 2/102 (2.0)                   | 19/135 (14.1)               |
| ≥ 5 times per day              | 2/204 (1.0)                   | 1/204 (0.5)                   | 2/135 (1.5)                 |
| Vegetables consumption         | ≤ 1 times per day             | 2 times per day               | 3 times per day             |
| ≤ 1 times per day              | 40/463 (8.6)                  | 190/463 (41.0)                | 233/463 (50.3)              |
| 2 times per day                | 27/290 (9.3)                  | 129/290 (44.5)                | 134/290 (46.2)              |
| 3 times per day                | 9/32 (2.8)                    | 31/32 (9.7)                   | 28/32 (8.8)                 |
| 4 times per day                |                               |                               | 31/32 (9.7)                 |
| Taught in school the benefits of eating more fruits and vegetables | Yes                       | No                            | I do not know               |
| Yes                            | 285/468 (60.9)                | 125/468 (26.7)                | 58/468 (12.4)               |
| No                             | 188/292 (64.4)                | 92/292 (31.5)                 | 12/292 (4.1)                |
| Carbonated soft drinks         | ≥ 1 time per day              |                               |                             |
| ≥ 1 time per day               | 168/463 (36.3)                |                               |                             |

Figures are numbers/total responses & data in brackets is percentage±standard error
available results of the last, i.e. ‘2007 Global School-based Student Health Survey - India (CBSE) Survey’, from the Public Use Codebook and Factsheet have been given in the right-most column.\[6,8\]

**Nutritional status and dietary behaviors [Table 2]**

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

This study findings of overweight and obese adolescents is 2.1–10.3% and 0.8–3.8%, respectively across different adolescence age and sex groups, similar to ‘2007 India (CBSE) GSIS’ findings.\[6\] Underweight adolescents are 3.4–11.6%.

There is a sharp rise in the 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 are 23.9% and 26.0% in the middle adolescent group. Also, there is a disparity between the nutritional status findings and the effort direction for weight.

A 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 vegetable consumption was also better than that of ‘2007 India (CBSE) GSIS’.\[8\]

The trends in carbonated soft drinks intake reveal 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) GSIS’.\[6,8\]

**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 the 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 this study (range 7.8%–12.2%) is slightly higher than the finding of 8.7% of the ‘2007 India (CBSE) GSIS’.\[8\]

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) GSIS’ (9.2-18.7% vis-a-vis 8%).\[8\] Also, there is a sharp rise in the number of girls feeling the same from early adolescence 9.8% to middle adolescence 18.7% in this 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) GSIS’ (25.5%).\[8\]

No close friends’ findings in our study are better (range 5.6–8.1%). The findings of students in the school being kind and

| 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     |                 |                             |                 |                          |
| within the past 30 days             |                 |                             |                 |                          |
| Cleaned or brushed their teeth      |                 |                             |                 |                          |
| <1 time per day during the past     |                 |                             |                 |                          |
| 30 days                             |                 |                             |                 |                          |
| 1 time per day                     |                 |                             |                 |                          |
| ≥ 2 times per day                  |                 |                             |                 |                          |
| Hand Washing                        |                 |                             |                 |                          |
| Never or rarely washed hands        |                 |                             |                 |                          |
| before eating during the past       |                 |                             |                 |                          |
| 30 days                             |                 |                             |                 |                          |
| Never or rarely washed hands        |                 |                             |                 |                          |
| after using the toilet or latrine   |                 |                             |                 |                          |
| during the past 30 days             |                 |                             |                 |                          |
| Toilet facilities                  |                 |                             |                 |                          |
| Separate toilets or latrines for    |                 |                             |                 |                          |
| boys and girls at school?           |                 |                             |                 |                          |
| Clean toilets or latrines           |                 |                             |                 |                          |
| Clean water for drinking            |                 |                             |                 |                          |

Figures are numbers/total responses & data in brackets is percentage±Standard error
helpful and parents or guardians understanding problems and worries are satisfactory and 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’. This is rising from early to middle adolescence, and sharply in girls. The findings for girls in physical activity and inactivity are worse as compared to boys in the present survey.

**Table 4: Mental health**

| Characteristic                          | Survey findings | GSHS India 2007 |
|----------------------------------------|-----------------|-----------------|
|                                        | Early adolescence (10-13 yr) | Middle adolescence (14-17 yr) | (13-15yrs) |
|                                        | 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 (90.2) | 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)  |
| Rarely/sometimes                       | 198 (42.3)      | 117/286 (40.9)  | 177/314 (56.4) | 92/145 (63.5)  |
| Most of the time/always                | 36/463 (7.8)    | 35/286 (12.2)   | 33/314 (10.5)  | 17/145 (11.7)  |
| 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)  |
| Rarely/sometimes                       | 201/458 (43.9)  | 126/286 (44.1)  | 145/314 (46.2) | 74/144 (51.4)  |
| Most of the time/always                | 42/458 (9.2)    | 28/286 (9.8)    | 34/314 (10.8)  | 27/144 (18.7)  |
| Feeling so sad or hopeless almost every day for two weeks or more in a row that you stopped doing your usual activities |                  |                  |         |        |
| No close friends                       | 36/444 (8.1)    | 21/277 (7.6)    | 25/312 (8.0)   | 8/144 (5.6)    |
| 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)  |
| Rarely/sometimes                       | 71/456 (15.6)   | 30/290 (10.3)   | 54/311 (17.4)  | 25/144 (17.3)  |
| Most of the times/always               | 341/456 (74.8)  | 212/290 (73.1)  | 203/311 (65.3) | 95/144 (66.0)  |

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

**Protective factors [Table 6]**

Findings in this study are better in all these factors as compared to ‘2007 India (CBSE) GSHS’.*

**Discussion**

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

**Nutritional status and dietary behaviours**

Nutritional status both lower and higher than ideal BMI has health effects. Proper health education early can address this with both short and long-term implications. The adolescents are image/body-conscious and effort direction for weight can be put on the right trajectory by teaching them about the importance
The importance of fruits and vegetables is well known. As per the Food guide pyramid, the adequacy of vegetables and fruits is defined as 4/5 and 3/4 servings per day for teenage girls/boys, respectively. The latest recommendations based on MyPlate emphasize making half the plate vegetables and fruits.\(^\text{[9]}\) Governmental advice on healthy diets is maximizing fruit and vegetable intake.\(^\text{[10]}\) The 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 schools a setting in which adolescents are especially vulnerable to feelings of loneliness, school-based strategies could be particularly useful and wide-reaching.\(^\text{[13]}\)

The findings of the adolescents who were worried about something so that they could not sleep at night most of the time/always points towards the need for early anti-anxiety measures and health education for a smooth transition across adolescent stages. The findings of ‘feeling sad or hopeless’, slightly higher than the ‘2007 India (CBSE) GSHS’ also justify proactive steps.\(^\text{[14]}\) 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.\(^\text{[13]}\)

Betterment of the aspects that students in the school being kind and helpful and parents or guardians understanding problems and worries can contribute to the best state of mental health. Categorization of the characteristics/indicators into distinct subgroups can contribute to a focused approach for distinctive policies and practical actions.

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**Table 5: Physical activity**

| Characteristic                                                                 | Survey findings Early adolescence (10-13 yr) | GSHS India 2007 (13-15yrs) |
|-------------------------------------------------------------------------------|---------------------------------------------|-----------------------------|
|                                                                              | \(n=468\) | \(n=292\) | \(n=327\) | \(n=145\) | \(n=292\) | \(n=145\) |
| Physically active for a total of at least 60 minutes per day on all 7 days during the past 7 days | 228/460 | 120/290 | 161/315 | 53/145 | (30.2±3) |
|                                                                 | \(49.6±2.3\) | \(41.4±2.9\) | \(51.1±2.8\) | \(36.6±4.0\) |
| 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 | 79/291 | 100/327 | 56/145 | (23.2±2.3) |
|                                                                 | \(25.6±2\) | \(27.1±2.6\) | \(30.6±2.5\) | \(38.6±4.0\) |

**Table 6: Protective factors**

| Characteristic                                                                 | Survey findings Early adolescence (10-13 yr) | GSHS India 2007 (13-15yrs) |
|-------------------------------------------------------------------------------|---------------------------------------------|-----------------------------|
|                                                                              | \(n=468\) | \(n=292\) | \(n=327\) | \(n=145\) | \(n=292\) | \(n=145\) |
| Students who missed classes or school without permission on one or more days during the past 30 days | 111/460 | 63/291 | 77/314 | 27/145 | (26.8±1.8) |
|                                                                 | \(24.1±2.2\) | \(21.6±2.4\) | \(24.5±2.4\) | \(18.6±3.2\) |
| 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 | 59/292 | 70/314 | 28/145 | (41±4.6) |
|                                                                 | \(17.9±1.8\) | \(20.2±2.3\) | \(22.3±2.3\) | \(19.3±3.3\) |
| 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 | 37/277 | 53/321 | 25/140 | (27.9±2.7) |
|                                                                 | \(9.6±1.4\) | \(13.4±2.0\) | \(16.5±2.1\) | \(17.9±3.2\) |

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Hygiene

Uncleanliness has realistic risks and maintaining cleanliness has rewarding results. More efforts can ensure 100% hygienic practices and 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.\(^\text{[14]}\) 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.\(^\text{[13]}\)

The findings of the adolescents who were worried about something so that they could not sleep at night most of the time/always points towards the need for early anti-anxiety measures and health education for a 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.\(^\text{[14]}\)
Physical activity
The trends for physical activity/inactivity are alarming and the findings of girls worrisome. Physical activity is desirable and 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.

Protective factors
Adolescents are often faced with situations for which they may not be prepared, and many are likely to be involved in risk-taking behaviors. Thus, protective factors are important. This study findings are better in all these factors as compared to '2007 India (CBSE) GSHS', 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.

Early adolescence is the beginning of the transition, and our study has importantly included this. Recently the associations of meeting established recommendations for diet, physical activity, sleep, and sedentary behavior in childhood with mental illness in adolescence were examined. Mental health in adolescence is associated with compliance with lifestyle recommendations in childhood, with stronger associations seen when more recommendations are met. Every additional recommendation met was associated with 15% fewer physician visits for mental illnesses (95% confidence interval: 9-21%). Health is physical, mental, and social well-being and not just the absence of disease. Thus, there is a strong case for healthy habits implementation early, energetically, and emphatically by all Primary care and Family physicians.

The American Academy of Pediatricians, on the basis of the unique biological and psychosocial aspects of adolescence, recommends educational programs and adequate financial compensation for pediatricians and other health care professionals to support them in providing evidence-based, quality primary care for adolescents.

The strengths of the study are: (i) Findings of early adolescence, as preventive and health promotion actions, should be early and (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 and 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 and vegetables consumption to how many servings/what part of the 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 and a healthy trajectory. The priorities for accomplishing the advancements of our adolescents health are (i) Popularizing the importance of and display of values of ideal BMI, (ii) best hygienic practices attainment by sustaining and strengthening the existing, (iii) betterment of mental health for a smooth transition across different stages of adolescence and being proactive for preventing worsening, (iv) early promotion of physical activity and prevention of inactivity, especially amongst adolescent girls, (v) strengthening and sustaining protective factors.

Key messages
Early & sustained efforts needed for a healthy trajectory, especially in domains showing deterioration across advancing physiological adolescence stages

Protective factors trending positively, pointing that the efforts of WHO and CDC of GSHS are bearing fruits and need to be sustained

Ground realities need to be periodically studied for channelizing resources

GSHS questionnaire needs to be advanced for accuracy & avenues

Acknowledgement
The authors would like to express their gratitude to the Army Public School-1 Lucknow, India and its students for their support and participation.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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