Physical Activity of School-Going Adolescents During the COVID-19 Pandemic: A Natural Experiment Study

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ABSTRACT

Objective: To assess the impact of the COVID-19 pandemic associated governmental restrictions on physical activity and sedentary behavior of school-going adolescents in India and its effect on nutrition and health status.

Methods: This was a before-after natural experiment study that recorded paired data of 449 (206 boys) school-going adolescents. COVID-19 related governmental measures (March 24, 2020 till February 2021) were taken as the natural experiment. The change in proportion of adolescents who met the recommended amount of physical activity guidelines and change in sedentary and dietary behaviors and body mass index (BMI) were compared.

Results: The proportion of adolescents performing adequate physical activity decreased from 33.9% to 30.7% (OR 1.2, 95% CI 0.9,1.6) during the pandemic. Fruit intake increased by 8.1% during the pandemic while junk food intake decreased by 17% during the pandemic. Mean (SD) BMI z-scores increased from -0.7)1.4) to -0.5)1.3) ($P < 0.001$).

Conclusion: While there was a small decrease in the proportion of physically active adolescents during the pandemic, a shift towards healthier dietary habits was seen.

Keywords: *Accelerometer, Lifestyle behaviors, Junk food, MVPA, Natural Experiment, Sedentary*

INTRODUCTION

The World Health Organization (WHO) defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure [1]. Physical inactivity is among the leading causes of mortality worldwide [1]. Globally, 81% of adolescents aged 11-17 years were insufficiently physically active in 2016 [2]. Physical activity decreases as the age increases [3-5]. Physical activity may be expressed in terms of types (e.g. aerobic, strengthening, flexibility etc.), duration, frequency, and intensity [1,6]. On an absolute scale, light intensity activity refers to activity that is performed at greater than 1.5-2.9 times the intensity of rest, while moderate to vigorous intensity activity is one that is performed at greater than 3 times the intensity of rest [1]. WHO recommends an average 60 minutes/day of moderate to vigorous intensity physical activity (MVPA) in a week; and vigorous intensity physical activity such as those to strengthen muscles and bones at least 3 times in a week in children and adolescents [7]. 'Exercise' is a sub-category of physical activity and may be defined as 'physical activity that is planned, structured, repetitive, and purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective' [8].

Schools are an attractive platform to promote physical activity among adolescents. However, during the COVID-19 pandemic, about 1 billion children and adolescents were affected by school closures worldwide [9]. The school closure along with other measures such as home confinement led to many indirect consequences for adolescents such as sleep disturbances, mental disorders,

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social isolation and change in lifestyle behaviors such as physical activity, sedentary and dietary behaviors [10]. Preliminary evidence suggests a decreasing trend in physical activity levels coupled with an increase in screen time [11-14]. However, a multicountry study showed an increase in proportion of physically active adolescents from before to during pandemic in Colombia, Spain and Italy [15]. A systematic review of changes in physical activity around the world during COVID-19 pandemic showed an average decrease of 17 minutes/day of MVPA in children and adolescents aged 4-18 years [16]. A similar decrease in physical activity during the pandemic was also noted in Indian adolescents and youth [17,18].

School-based physical activity is likely to change during pandemics like COVID-19 [19]. The aim of the 'Impact of COVID-19 on the physical activity, sedentary and dietary behavior of school-going adolescents (ICPASA)' study was to assess the effect of COVID-19 associated governmental restrictions on the health of school-going adolescents. We compared the sedentary behavior, nutritional status and dietary behavior of adolescents before and during the COVID-19 pandemic.

METHODS

The study was a before-after, natural experiment study design wherein the baseline measurements were taken before the pandemic (September 2018 - February 2019) and follow-up measurements were done during the pandemic (October 2020 - March 2021). Governmental measures such as lockdown and school closures started in India on the March 24, 2020.

The study participants included adolescents enrolled in schools of Mohali, Punjab, India. The study was initially planned as a cluster randomized trial. COVID-19 related school closures, limited the interventional design and the pandemic related governmental measures were taken as a natural intervention. A total of 20 schools, 10 government (public) and 10 private schools, were randomly recruited for the study following permission from the Department of Education, Punjab. The details of school selection and recruitment were described earlier [20]. The study was approved by the Institute Ethics Committee and registered in a trial registration.

People were asked to stay at home to avoid exposure to the coronavirus and observe physical distancing when stepping out of the house for essential services. The school summer break came to an end in the first week of July after which both public and private schools gradually started online education while they were still closed.

Baseline measurements were conducted before the pandemic (2018-19). Schools that had a higher number of absentees on the day of data collection were revisited for the second time to maximize the response rate per school. Physical activity, sedentary and dietary behaviors were measured using a modified version of the Global School-Based Student Health Survey (GSHS) 2006 questionnaire which encompasses school-time MVPA, strengthening exercises and transport domain related physical activity (PA) [21]. Questions related to leisure-time PA were included from Baecke questionnaire [22], and those related to recess-time PA were included from Physical Activity Questionnaire for older children (PAQ-C) [23] (**Web Table I**). Anthropometric measurements of height, weight and waist circumference were recorded. Body Mass Index (BMI) was manually calculated by the standard formula using height and weight measurements. The objective measures of physical activity using accelerometer ActiGraph GT3x-BT were recorded in a sub-sample. Students were given verbal instructions to wear ActiGraphs for 7 days mounted on the right side of the waist in front of the right hip at all times except while sleeping or performing water activities such as swimming and bathing. The raw data recorded in the Actigraph was converted into objective activity using the ActiLife6 software. Data was considered valid if the accelerometer was worn for at least 3 days a week (minimally two week days and 1 weekend day) and for at least 480 minutes in a day.

As per the government's guidelines a hybrid mode of both online and offline classes were adopted by most schools and schools were opened in a phased manner starting October 2020 when all schools that participated during baseline were approached for follow-up measurements. The same students who participated in baseline measurements (6th to 8th class) were included in follow-up measurements approximately two years later (8th to 10th class).

For the follow-up measurements, a few questions related to lifestyle behaviors were included in the modified GSHS 2006 questionnaire used during baseline data collection and was pretested in a similar population. See **Web Table II**. Data collection of self-report measures of physical activity, sedentary and dietary behavior which started in October 2020 was conducted via online questionnaire while the schools were still closed. Physical activity was measured objectively with an accelerometer and subjectively with a questionnaire. As regular classes resumed by January 2021, students who participated in baseline measurements and attended schools during the pandemic were approached for objective physical activity measures using ActiGraph and anthropometric measurements. Anthropometric measurements of height, weight and waist circumference were recorded. BMI was

calculated using the formula weight (kg) /height (m^2) and computed into BMI z-scores as per the 2007 WHO references [24]. ActiGraphs were selectively handed out to students whose ActiGraph measurements were recorded during baseline and who were present on the day of data collection. Data collection was done adhering to the latest guidelines issued by the government to prevent the spread of COVID-19.

The change in proportion of adolescents reaching the recommended level of physical activity using self-reported measures as per WHO guidelines was the primary outcome of the study. Secondary outcomes included lifestyle changes in adolescents in terms of physical activity and sedentary behaviors; dietary modifications, objective measures of physical activity (assessed in a subsample) and change in anthropometry (BMI and waist circumference) were assessed as indicators of under-nutrition and overweight/obesity.

Statistical analysis: IBM SPSS Statistics for Windows (version 28) was used for statistical analyses. The differences between paired proportions were assessed using the McNemar test and reported as odds ratio with 95% confidence interval (CI). The comparison of continuous variables was performed with paired-samples *t* tests for before-after differences and independent samples *t* test for between group differences. Two-sided *P* values < 0.05 were considered statistically significant. The 95% CI

for odds ratio of paired observations was computed using an online calculator (*http://vassarstats.net/propcorr.html*).

RESULTS

A total of 1308 students were approached and 1086 students (83%) participated in the baseline measurements. The flow of the study participants is shown in **Fig. 1**. 20 schools participated at baseline while 18 schools participated in the follow-up measurements as two private schools dropped out included unwillingness to participate, not enough attendance, or other pandemic related priorities at the time. There were no statistically significant differences between the baseline characteristics of those adolescents who participated in the study versus who dropped out/ refused to participate after the initial recruitment (*data not shown*).

Table I shows the socio-demographic characteristics of 449 participants at baseline. **Table II** describes the adolescents' physical activity, sedentary and dietary behaviors recorded using the modified GSHS question-naire. **Table III** shows paired data of anthropometric indices of 308 adolescents categorized by gender and school type. **Table IV** illustrates the results from objec-tively measured physical activity and sedentary time (*n* = 37) using ActiGraph wGT3x-BT. When adjusted for wear time, the time spent in light physical activity and counts per minute were lower during the pandemic than before.
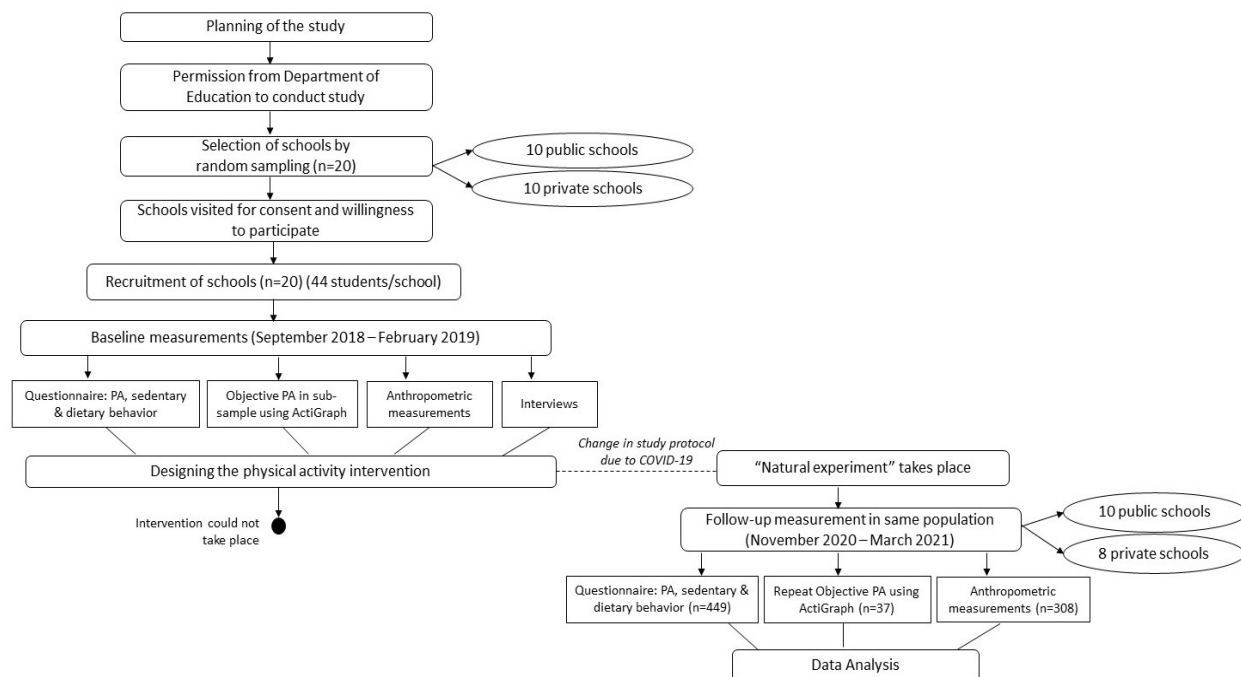

Fig.1 Criteria of School Selection and Recruitment

Table I Demographic Profile of Participants at Baseline (*n* = 449)

Characteristics	Values
Age[a], y	12.9 (1.2)
Boys	206 (45.9)
Government School	256 (57)
Private School	193 (43)
Parental Education	
• Maternal literacy[b]	263 (59.4)
• Paternal literacy[c]	335 (76.8)
Body mass index (BMI)[a], kg/m^2	17.9 (3.2)
Waist circumference[a], cm	62.8 (8.3)

Data expressed as [a]mean (SD) or n (%); Missing values [b]n = 6 and [c]n = 13

The follow-up survey on behavior and perceptions about the lifestyle during home confinement reported that 180 (40.8%) adolescents received physical activity related assignments from school such as doing yoga at home on a daily or weekly basis during school closures. Most adolescents reported spending less than two hours of screen-time for school assignments (*n* = 317, 71.0%) and screen-time for leisure (*n* = 349, 78.1%). While 167 (37.2%) adolescents reported to have gained weight, 163 (36.3%) did not perceive weight gain and 119 (26.5%) were unaware of change in weight.

DISCUSSION

The present study reports an increase in BMI and a decrease in physical activity of adolescents during the pandemic. The proportion of adolescents with adequate physical activity levels according to WHO guidelines in the current study was comparable to another study reporting Indian data [25]. There was a small, non-significant decrease in this proportion during the pandemic. There was a shift towards healthier dietary patterns during the pandemic with adolescents eating more fruits and less junk food. This is in contrast with studies from other countries that reported unhealthy dietary patterns during home confinement [15,26]. The healthier shift in the current study may have resulted from families preferring home-cooked food and opting for healthier snacking options like fruits. During this time, many small businesses including restaurants serving junk food were closed or completely shut down. Additionally, the general preference to avoid unhygienic practices that may be involved in preparation of junk food, including avoidance of contact with unknown persons, may have contributed to a significant decrease in its consumption.

The BMI and waist circumference as anthropometric indices of obesity increased significantly during the pandemic. This significant increase was also reflected within subgroups as per gender and school types. The gain in BMIZ score from underweight towards normal weight category may be result of consumption of more fruits and less junk food with a healthier behavior of adolescents during the pandemic.

There was limited data for accelerometry during the pandemic as fewer students attended schools. While the data reports an increase in wear time during the pandemic, the mean counts per minute (CPM) decreased significantly during this time. Data further reports a significant decrease in light PA, and no significant increase in moderate to vigorous physical activity (MVPA). This reduction in CPM may be explained with the type of PA performed by the adolescents. It is possible that adolescents were doing less light-intensity physical activity such as walking to school every day, or housework like buying groceries, or the house-work may have been divided among family members. Therefore, even though data measured in a sub-sample may have limited external validity, it still has some

Table II Comparison of Physical Activity, Sedentary behavior, and Dietary Behavior (*n* = 443)

	Missing (n)	Before COVID-19	During COVID-19	Odds ratio / Mean Difference[b] (95% CI)	P value
Physically active[a]	6	150 (33.9)	136 (30.7)	1.2 (0.9, 1.6)	0.322
60 minutes daily PA, d/wk[b]	6	4.8 (2.4)	3.9 (2.8)	0.9 (0.6, 1.2)	0.121
Stretching exercises, d/wk[b]	4	4.0 (2.3)	3.2 (2.8)	0.9 (0.5, 1.2)	< 0.001
Leisure Time PA score[c]	21	9.9 (2.5)	9.8 (2.8)	0.1 (0.3, 0.4)	0.665
Sleeping for >8 h/d[a]	2	193 (43.2)	222 (49.7)	1.3 (1.0, 1.7)	0.059
Fruit at least once/d[a]	4	298 (67.0)	334 (75.1)	1.6 (1.2, 2.3)	0.004
Vegetable at least once/d[a]	3	416 (93.3)	399 (89.5)	1.7 (1.0, 2.8)	0.046
Junk food at least 3 d/wk[a]	2	240 (53.7)	164 (36.7)	2.2 (1.6, 3.0)	< 0.001

Data presented as [a]n (%) and [b]mean (SD); [c]Leisure time PA was divided into 3 categories of Play, walk and cycle (from Baecke questionnaire) and asked on a Likert scale ranging from 1=never to 5=very often. This score is the average of the sum of 3 scores. PA: Physical activity

WHAT THIS STUDY ADDS?
• The adolescents adopted healthier dietary practices but had decreased physical activity during the pandemics than before.

Table III Comparison of BMI z-Score by Gender and School

	n	Before COVID-19	During COVID-19	Mean Diff (95% CI)	P-value
BMIZ score	308	- 0.7 (1.4)	- 0.5 (1.3)	0.2 (0.1, 0.3)	< 0.001
Gender					
Boys	143	- 0.8 (1.5)	- 0.7 (1.5)	0.1 (0.0, 0.2)	0.019
Girls	165	- 0.6 (1.3)	- 0.4 (1.1)	0.2 (0.1, 0.4)	< 0.001
School Type					
Government	195	- 1.0 (1.2)	- 0.8 (1.2)	0.2 (0.1, 0.3)	< 0.001
Private	113	- 0.3 (1.6)	- 0.1 (1.5)	0.2 (0.1, 0.4)	0.012

Data presented as mean (SD); BMIZ Body mass index z-score

Table IV Comparison of Physical Activity of Adolescents (as Measured by Accelerometry)

	Before COVID-19 (n=37)	During COVID-19 (n=37)	Mean Diff (95% CI)	P value
% wear time spent in MVPA	17.3 (7.2)	18.0 (6.5)	- 0.7 (- 3.0, 1.6)	0.547
% wear time spent in Light PA	9.0 (2.0)	8.1 (2.0)	1.0 (0.2, 1.8)	0.020
% wear time spent Sedentary	73.7 (8.9)	73.8 (7.7)	- 0.1 (- 2.9, 2.7)	0.920
Counts per minute[a]	798.2 (297.5)	776.2 (278.4)	- 22.0 (64.7, 108.7)	< 0.001
MVPA ≥ 60 minutes[a]	24 (65.5)	21 (57.4)	1.7 (7.0, 0.4)	0.727

Data presented as mean (SD) or [a]n (%). MVPA Moderate to vigorous physical activity, PA Physical activity

internal validity as it highlights the changes in intensity and types of physical activity in adolescents during that time.

The study results need to be looked at with certain limitations. The response rate of online questionnaires was low despite frequent reminders. As the schools gradually started reopening, it became easier to reach out to adolescents who physically attended schools. However, many adolescents continued with online education as their parents did not consent to send their children to attend schools. A few families were displaced from their homes as businesses/non-essential services were shutting down, while a few adolescents had finished middle schools, and a few older adolescent boys had started working during the pandemic to support their families. This led to a high dropout rate of 59%. The sample included for the purpose of the study was representative of the total study population at baseline. Anthropometric measurements and accelerometry could only be done for students who attended schools. The included sample for accelerometry was not representative of the entire sample population. Therefore, the results of the objective data could not be used to further describe or supplement the results of the subjective data from the questionnaire.

The COVID-19 related governmental regulations had a varied impact in different countries on lifestyle behaviors like physical activity and dietary behaviors. These differences arise due to the cultural differences between countries, and the societal and environmental factors that influence the behavioral choices made by adolescents. Therefore, policies around physical activity, sedentary and dietary behaviors in future pandemics or natural disasters must address societal inequalities and should be culturally adaptable so that they do not alter the lifestyle of adolescents.

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Modified GSHS 2006 Questionnaire (For Baseline Assessment)

Study Questionnaire

Name of School: _____

 School Code No: _____

Student ID: _____

1. How old are you?

A   11 years old or younger
B   12 years old
C   13 years old
D   14 years old
E   15 years old
F   16 years old or older

2. What is your sex?

A   Male
B   Female

3. In what class are you?

A   Class 6
B   Class 7
C   Class 8
D   Class 9
E   Class 10
F   Class 11

4. What is your family's monthly income?

5. Height

6. Weight

7. Waist Circumference

8. Date of Birth

Physical Activity Module

Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, playing with friends, or walking to school. Some examples of physical activity are running, fast walking, biking, dancing, or football.

ADD UP ALL THE TIME YOU SPEND IN PHYSICAL ACTIVITY EACH DAY. DO **NOT** INCLUDE YOUR PHYSICAL EDUCATION OR GYM CLASS

The next 2 questions ask about physical activity.

9. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?

A. 0 day
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days

10. During a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?

A   0 day
B   1 day
C   2 days
D   3 days
E   4 days
F   5 days
G   6 days
H   7 days

The next 2 questions ask about physical education class and stretching exercises.

11. During this school year, on how many days did you go to physical education class each week?

A   0 day
B   1 day
C   2 days
D   3 days
E   4 days
F   5 days or more

12. During the past 7 days, on how many days did you do stretching or strengthening exercises, such as toe touches, knee bends, or push-ups?

A   0 day
B   1 day
C   2 days
D   3 days
E   4 days
F   5 days
G   6 days
H   7 days

The next question asks about hours of sleep per day

13. Typically, how many hours do you sleep per day?

A   Less than 4 hours
B   4 to 6 hours
C   6 to 8 hours
D   8 to 10 hours
E   More than 10 hours

The next question asks about the time you spend mostly sitting when you are not in school or doing homework.

14. How much time do you spend during during a typical or usual day sitting and watching television, playing computer games, talking with friends, or doing other sitting activities, such as listening to music?

A   Less than 1 hour per day
B   1 to 2 hours per day
C   3 to 4 hours per day
D   5 to 6 hours per day
E   7 to 8 hours per day
F   More than 8 hours per day

The next 2 questions ask about going to and coming home from school.

15. During the past 7 days, on how many days did you walk or ride a bicycle to and from school?

16. During the past 7 days, how long did it usually take for you to get to and from school each day? ADD UP THE TIME YOU SPEND GOING TO AND COMING HOME FROM SCHOOL.

The next 2 questions ask about your total physical activity per day.

17. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?

A 0 day
B 1 day
C 2 days
D 3 days
E 4 days
F 5 days
G 6 days
H 7 days

18. During a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?

A 0 day
B 1 day
C 2 days
D 3 days
E 4 days
F 5 days
G 6 days
H 7 days

19. In the last 7 days, what did you normally do *at recess/lunch* (besides eating lunch)? (Check one only.)

A. Sat down (talking, reading, doing schoolwork).
B. Stood around or walked around.
C. Ran or played a little bit.
D. Ran around and played quite a bit.
E. Ran and played hard most of the time.

The next 3 questions ask about leisure time physical activity

20. During Leisure time, I play sport.

A Never
B Seldom
C Sometimes
D Often
E Very often

21. During leisure time, I walk.

A Never
B Seldom
C Sometimes
D Often
E Very often

22. During leisure time, I cycle.

A Never
B Seldom
C Sometimes
D Often
E Very often

Diet Module

The next 4 questions ask about foods you might eat and drinking and eating habits.

23. During the past 30 days, how many times per day did you usually eat fruit, such as apple, mango, banana, pineapple, papaya, jackfruit, guava, or

A I did not eat fruit during thepast 30 days
B Less than one time per day
C 1 time per day
D 2 times per day
E 3 times per day
F 4 times per day
G 5 or more times per day

24. During the past 30 days, how many

times per day did you usually eat vegetables, such as cauliflower, ladyfinger, pumpkin, brinjal, cabbage spinach, peas, tomato, cucumber, or beans?

A I did not eat vegetables during the past 30 days
B Less than one time per day
C 1 time per day
D 2 times per day
E 3 times per day
F 4 times per day
G 5 or more times per day

25. During the past 30 days, how many times per day did you usually drink carbonated soft drinks, such as Coke, Pepsi, Limca, or Fanta?

A I did not drink carbonated soft drinks during the past 30 days
B Less than one time perday

26. During the past 7 days, on how many

A 0 days
B 1 day
C 2 days
D 3 days
E 4 days
F 5 days
G 6 days
H 7 days

days did you eat at a fast food restaurant, such as McDonalds, Pizza Hut, or at those serving quick meals (e.g. Samosas, patties, burgers, noodles, tikkis, or ice-creams)?

The next 2 questions ask about the benefits of healthy eating or eating more fruits and vegetables.

27. During this school year, were you taught in any of your classes the benefits of healthy eating?

A Yes
B No
C I do not know

28. During this school year, were you taught in any of your classes the benefits of eating more fruits and vegetables?

A Yes
B No
C I do not know

Web Table II Modified GSHS 2006 Questionnaire (For Follow-up Measurement)

ICPASA Study Questionnaire

Name of School: _____

School Roll No. _____

1. How old are you?

A   11 years old or younger
B   12 years old
C   13 years old
D   14 years old
E   15 years old
F   16 years old
G   17 years or older

2. What is your gender?

A   Male
B   Female

3. In what class are you?

A   Class 6
B   Class 7
C   Class 8
D   Class 9
E   Class 10

4.What is your total monthly family income? ----------------------

A. Height   ---
B. Weight
C. Waist Circumference
D. Date of Birth5(i) Mother's education
    a.   Middle school
    b.   High school
    c.   College
    d.   Did not attend school

5(ii)Father's education

    a.   Middle school
    b.   High school
    c.   College
    d.   Did not attend school

Physical Activity Module

Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, playing with friends, or walking to school. Some examples of physical activity are running, fast walking, biking, dancing, or football.

ADD UP ALL THE TIME YOU SPEND IN PHYSICAL ACTIVITY EACH DAY.

The next 3 questions ask about physical activity.

6. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?

A. 0 day
B. 1 day
C. 2 days
D. 3 days
E. 4 days

F. 5 days
G. 6 days
H. 7 days

7. During a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?

A. 0 day
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days

8. During the past 7 days, on how many days did you do stretching or strengthening exercises, such as toe touches, knee bends, or push-ups?

A   0 day
B   1 day
C   2 days
D   3 days
E   4 days
F   5 days
G   6 days
H   7 days

The next question asks about hours of sleep per day.

9. Typically, how many hours do you sleep per

A   Less than 4 hours
B   4 to 6 hours
C   6 to 8 hours
D   8 to 10 hours
E   More than 10 hours day?

The next questions ask about the time you spend mostly sitting when you are not in school or doing homework.

10. How much time do you spend during a typical or usual day sitting and watching television, playing computer games, talkingwith friends, or doing other sitting activities, such as listening to music?

A   Less than 1 hour per day
B   1 to 2 hours per day
C   3 to 4 hours per day
D   5 to 6 hours per day
E   7 to 8 hours per day
F   More than 8 hours per day

11. How much time do you spend in front of the screen (TV, laptop, using mobile phone) for home-work/school-work?

A   Less than 1 hour per day
B   1 to 2 hours per day
C   3 to 4 hours per day

D   More than 4 hours per day

12. How much time do you spend in front of the screen (TV, laptop, using mobile phone) for leisure activities?

A   Less than 1 hour per day
B   1 to 2 hours per day
C   3 to 4 hours per day
D   More than 4 hours per day

13. During school closures, how many times did you receive assignments from school related to physical activity, such as yoga/ walking/ aerobics etc.?

(a) Daily
(b) Weekly
(c) fortnightly (once in 15 days)
(d) Monthly
(e) Rarely
(e) Never

14. During Leisure time, I play sport

(a) Never
(b) Seldom (2-3 times/month)
(c) Sometimes (once a week)
(d) Often (2-3 times/week)
(e) Very often (4-5 times/week)

15. During leisure time, I walk

(a) Never
(b) Seldom (2-3 times/month)
(c) Sometimes (once a week)
(d) Often (2-3 times/week)
(e) Very often (4-5 times/week)

16. During leisure time, I cycle

(a) Never
(b) Seldom (2-3 times/month)
(c) Sometimes (once a week)
(d) Often (2-3 times/week)
(e) Very often (4-5 times/week)

Dietary habits

The next 4 questions ask about foods you might eat and drinking and eating habits1

7.   During the past 30 days, how many times per day did you usually eat fruit, such as   apple, mango, banana, pineapple, papaya, guava, or chikoo?

A.   I did not eat fruit during the past30 days
B.   Less than one time per day
C.   1 time per day
D.   2 times per day
E.   3 times per day
F.   4 times per day
G.   5 or more times per day

18. During the past 30 days, how many times per day did you usually eat vegetables, such as cauliflower, ladyfinger, pumpkin, brinjal, cabbage, spinach, peas, tomato, cucumber or beans?

A.   I did not eat vegetables duringthe past 30 days
B.   Less than one time per day
C.   1 time per day
D.   2 times per day
E.   3 times per day
F.   4 times per day
G.   5 or more times per day

19. During the past 30 days, how many times per   day did you usually drink carbonated soft drinks, such as Coke, Pepsi, Limca, or Fanta, or sweetened juices like Real juice, Frooti, Tropicana juice etc.?

A.   I did not drink carbonated softdrinks during the past 30 days
B.   Less than one time per day
C.   1 time per day
D.   2 times per day
E.   3 times per day
F.   4 times per day
G.   5 or more times per day

20. During the past 7 days, on how many days did you eat or order at a fast food restaurant, such as McDonalds, Domino's, Burger King noodles/chinese, tikkis, or ice creams)?

A.   0 day
B.   1 day
C.   2 days
D.   3 days
E.   4 days
F.   5 days
G.   6 days
H.   7 days

The next 2 questions ask about the benefits of Healthy eating or eating more fruits and vegetables.

22. During this school year, were you taught in any of your classes the benefits of eating more fruits and vegetables?

A   Yes
B   No
C   I do not know

23. Has your consumption of snacks and branded foods like chips, namkeen, soups (like Knorr and Maggie), Maggie noodles or frozen foods (like McCain) changed during school closures

A   Yes
B   No
C   I do not know

24. Did you gain weight during the school closure?

A   Yes
B   No
C   I do not know