



# **Effect of junk food consumption on the nutritional status of adolescents**

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**One Health Institute**

**Chattogram Veterinary and Animal Sciences University**

**Chattogram-4225, Baangladesh**

**March 2023**

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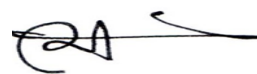
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The Author

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**Dedicated**  
**To my**  
**Beloved**  
**Family, Friends and**  
**Honourable Teacher**

## Table of Contents

Acknowledgment .....	v
List of Figures .....	ix
List of Tables .....	ix
List of Abbreviations .....	x
Abstract .....	xi
Chapter 1: Introduction .....	1
Chapter-2: Review of literature .....	4
2.1 Reasons for junk food popularity .....	5
2.2 Measures to assess Nutritional Status .....	5
2.3 Association of junk food and human diseases .....	9
Chapter-3: Methodology .....	13
3.1 Study Area.....	13
3.2 Ethical Implications.....	13
3.3 Study Design .....	13
3.4 Study Population .....	14
3.5 Sample Size Calculation.....	14
3.6 Data Collection.....	14
3.7 Data Collection Tool .....	15
3.8 Categorization of Obese and Non-obese Participants .....	15
3.9 Statistical Analysis .....	16
Chapter-4:Results.....	17
4.1 Univariate association of binary response of obesity with the associated factors ..	17
4.2 Gender-wise prevalence of junk food consumption and its association with obesity .....	22
4.3 Univariable logistic regression model of obesity with the associated factors.....	24
4.4 Multivariable logistic regression model of obesity with the associated factors.....	26

Chapter-5:Discussion .....	27
Chapter-6: Conclusion .....	30
Chapter-7: Recommendation and Future Perspective.....	31
Limitations of the Study .....	31
References .....	32
Appendices.....	37
Questionnaire .....	39
Photo Gallery.....	47
BRIEF BIOGRAPHY OF THE STUDENT .....	50



## **List of Figures**

Figure 1. BMI Chart.....	6
Figure 2 Data collection from middle adolescents .....	47
Figure 3 Data Collection from Late Adolescents.....	47
Figure 4 Questionnaire submitted by School Going Adolescents .....	48
Figure 5 Questionnaire Submitted by College Going Adolescents .....	48
Figure 6 Ethical Review Committee Approval.....	49

## **List of Tables**

Table 1: BMI Range for Early Adolescents .....	8
Table 2: BMI Range for Late Adolescents.....	8
Table 3: BMI Range for Late Adolescents.....	8
Table 4: Univariate association of binary response of obesity with the associated Demographic factors.....	18
Table 5: Univariate association of binary response of obesity with different lifestyle-related factors.....	19
Table 6: Univariate association of binary response of obesity with the different food habit-related factors.....	20
Table 7: Gender-wise prevalence of junk food consumption and its association with obesity .....	22
Table 8: Univariable logistic regression model of obesity with the associated factors ....	25
Table 9: Multivariable logistic regression model of obesity with the associated factors .	26
Table 10: Demographic data of junk food consumption in the study areas.....	37

## **List of Abbreviations**

BMI	:	body mass index
WHO	:	World Health Organization
BMR	:	basal metabolic rate
SES	:	socio-economic status
AAP	:	American Academy of Pediatrics
ROC	:	receiver operating characteristic
CI	:	confidence interval
CDC	:	Center for Disease Control and Prevention
SD	:	standard deviation
RDA	:	recommended dietary allowance
PCOS	:	poly-cystic-ovary syndrome
OR	:	odds ratio
BBS	:	Bangladesh Bureau of Statistics
UNICEF	:	United Nations Children's Fund
Z-score	:	standard deviation score
kg	:	kilogram
m <sup>2</sup>	:	meter square
%	:	percentage
>	:	greater than
<	:	less than
≥	:	greater equal
≤	:	less equal
kg/m <sup>2</sup>	:	kilogram per meter square
kcal	:	kilocalorie
p-value	:	probability value

## Abstract

Junk food consumption affects adolescent brain development in a manner that restricts their capacity for thought, learning, and memory. Additionally, it might make it harder to control impulsive behavior, and it might potentially raise an adolescent's likelihood of anxiety and depression. The current study aimed to find out the effect of junk food consumption on the nutritional status of the school and college-going adolescents. A cross-sectional study was conducted among 390 adolescent students of Chattogram city. Two schools (Housing and Settlement Public School and CIDER International School) and two colleges (Pahartali College and Cambrian College) were chosen randomly. Adolescents were categorized into middle, and late adolescents. Data were collected from the categorized adolescent students using a pre-tested questionnaire. The data were analyzed by statistical software: STATA 17. Results demonstrated that male adolescent students (57%, 221/390) consumed junk foods more than female adolescent students (43%, 169/390). A total of 8% of participants (n=32) among the study population were found obsessed and the level of junk food consumption was very high in these groups in comparison to non-obsessed groups. Junk food consumption level was high among the participants of the CIDER International School (15.71%) followed by Housing and Settlement Public School (11.67%), Cambrian College (4%), and Pahartali College (3%). Consumption of Junk Food was significantly associated with gender, participants' mothers' education, fathers' occupation, type of junk food consumed, and places of junk food consumption. The investigation also found that male participants (OR: 2.49, CI: 0.99-6.24) were highly significant in developing obesity than female participants. Participants whose mothers completed graduation were more significant to develop obesity (OR: 6.4, CI: 1.97-19.96) due to high junk food consumption. Participants who had a high risk of developing obesity due to junk food consumption whose fathers were in service (OR:4.83, CI:1.67-14.03). Fast food consumers in high amounts had a high chance of developing obesity (OR: 9.08, CI:1.05-78.87). It was also revealed that participants used to eat junk food when they were at schools or colleges and also had a high chance of developing obesity (OR: 12.51, CI: 0.5-40.92). Both male and female adolescent students consumed an astonishing amount of junk food, even though they are aware (100%) of the negative effects of junk food. As the consumption of junk food negatively affects the health of adults including adolescents, therefore, the appropriate authorities should take necessary action to curve its consumption.

**Keywords:** Adolescents, junk food consumption, obesity, nutritional status.

## **Chapter 1: Introduction**

Any component that primarily consists of protein, carbohydrate, fat, and other minerals is referred to as food. These nutrients are used by a creature's body to support growth and essential processes as well as to provide energy. (Britannica, 2020). A balanced diet, according to WHO, consists of 50–60% carbohydrates, 10-15% protein, and 25–30% fat, as well as vitamin and mineral intake in accordance with suggested daily allowances (Pinatih, 2020).

It is said that human life needs five things: food, health, clothing, shelter, and education. Food is the first basic human need (Chapman & Maclean, 1993). Because food is extremely important to live in the world. Without food, no one can live for a long time. Humans and animals both need food to live as well as to gain energy (Spronk et al., 2014).

Junk Food is a very important term in human life. Junk food is an unhealthy food containing a high amount of chemical additives. With few dietary fiber, protein, vitamins, minerals, or other significant nutritious components, this type of food is high in calories from fat or sugar and low in other types of nutrients (Singla et al., 2012).

Again, food that lacks nutritional value and is typically rich in calories, sugar, or fat is referred to as junk food (Franck et al., 2013). Humans love delicious and appealing food since the beginning of the creature. But most of the delicious food items are not healthy. And unhealthy food impacts our health system. It creates different types of diseases/disorders like cancer, gastritis, high cholesterol, ulcer, etc. Unhealthy food is harmful to both children and adults (Salam et al., 2016). Around 48% of people worldwide consume junk food according to a global assessment. With significant negative effects on both health and the environment, about half of the world's population has poor nutrition related to excess or insufficient food consumption (TRTWORLD, 2021).

Junk food has become very popular among all ages of people (Li, et al., 2020). It has become one of the trends among all ages of people especially in children, young boys and girls. The prepared appearance, subordinate cost, taste, publicity, and peer pressure make them famous among students. Most unhealthy junk foods are sold on the street side, in front of schools; colleges; universities, etc (Rehman et al., 2018). Junk food bears a high level of bad impact on children and teenagers. It creates influences the nutritional status of adolescent boys and girls greatly. In various studies, it is shown that adolescent girls consume street food more than adolescent boys (Younis & Eljamay, 2019).

Adolescence is one of the most vital stages of growth and development of human life and nutritional imbalance during this stage can create a phenomenal impact on proper growth and development (Islam, et al., 2015). The adolescent period of girls is generally ranged between 10-19 ages in the context of Bangladesh (Leroy et al., 2018). Allen and Waterman stated in the American Academy of Pediatrics that the adolescent period contains three stages. These three stages are early, middle, and late adolescence. Early adolescence encompasses 10-13 years. Ages between 14 and 17 are considered middle adolescents. Later adolescence lasts between 18 and 21 years (Allen & Waterman, 2019). According to WHO, Nutrition is a critical part of health and development. The nutritional status of a person usually relies on two factors, external factors like food safety, cultural, convivial, and economic factors, and internal factors like youth, gender, nutrition, attitude, physical action, and diseases of the person (Alam et al., 2010).

In Bangladesh, the range for fast food consumption once or twice per week was found between 25.0% and 68.1% (Banik et al., 2020). Most of the people in Bangladesh consume junk food in high amounts. The practice of eating fast food has taken the place of conventional meals among people, particularly among adolescents and kids. Junk food consumption creates a great impact on the nutritional status of adolescents (Huq, 2012). Junk food affects very badly the health of adolescents and other individuals. Between childhood and maturity, the adolescent stage is a crucial time for growth and development (Malmi, et al., 2022). The imbalance of nutrition at this age can hamper the health of adolescents by causing various diseases like obesity, malnutrition, anaemia, high cholesterol, diabetes etc. These kinds of diseases will weaken the immune system of adolescents early. However, this will also impact mental health greatly. Adolescents in Bangladesh are seen to consume junk foods mostly with the influence of their peers and crave for having delicious food that is found on the street side and in restaurants. Thus it has become a great public health concern. Therefore, the present study was carried out to find out the effect of junk food consumption on the nutritional status of school and college goers adolescents in Chattogram city, Bangladesh.

The specific objectives of the present investigation were as follows: -

- To determine the effect of junk food consumption in adolescents including the prevalence based on obesity.
- To identify the factors associated with junk food consumption including the relationship between junk food consumption with obesity in adolescents.

## **Chapter-2: Review of literature**

Food needs to be nourishing in order to live a healthy existence. (Kurz, 1996). Food, according to the WHO, is any nutrient that humans, animals, or plants consume to sustain life and development. To acquire energy, correctly nourish the body, maintain the body's electrolyte balance, and prevent any harmful diseases from developing, one must eat nutritious food (White & Tate, 2001).

Junk food is defined as foods and beverages that are high in calories, saturated fat, added sugar, and/or sodium but low in nutrients (such as vitamins, minerals, and fiber). The popularity of junk food consumption is highly rising all over the world (Scaglioni, Salvioni, & Galimberti, 2008). In various studies, it is found that Junk food consumption in European countries is high than in other countries in the world (Baig & Saeed, 2012).

Junk food has become not only popular in urban areas but also in rural areas. According to a study by Banik and his friends, the consumption of fast food and junk food by youths around the world is on the rise. In Bangladesh, there are 68.1% of college-bound adolescents report eating fast food regularly. Approximately 64% of adolescents routinely eat fast food. And the rationale for this is that the primary forces behind people's consumption of fast food are pleasure or flavor and convenience. (Banik et al., 2020).

According to Md. Kamruzzaman of the website Asia-Pacific in 2022, experts and parents agree that obesity and overweight are frighteningly on the rise in Bangladesh, particularly among kids and adolescents, as a result of the quick spread of the fast-food culture and changing lifestyles. It can be challenging for parents who are overworked to cook healthy foods for their kids at home. According to a joint study conducted by the Bangladesh Bureau of Statistics (BBS) and United Nations Children's Fund (UNICEF) and released in 2014, 1.4% of Bangladeshi children under the age of five are obese. Additionally, the South Asian delta nation of nearly 170 million people has an obesity rate of 23.6% among adolescents and 17.9% among children (Obesity on Rise in Bangladesh Children Owing to Junk Food, Unhealthy Lifestyles, 2022).

There are various types of junk food. According to Bohara, Thapa, Bhatt, Dhama, & Wagle, junk food can be fast food, carbonated drinks, chips, desserts, chocolates, etc (Bohara et al., 2021).

In order to determine the impact of unhealthy food consumption on teenagers' nutritional state, a study was carried out in Italy. (Borraccino et al., 2016). The study program gathered information on dietary habits, sedentary habits, physical activity, BMI, and socioeconomic

status (SES). (Freedman & Berenson, 2017). Researchers discovered in the study that eating junk food was strongly linked to eating less fruit and vegetables and to becoming more sedentary in people of all ages and genders. There are also studies on identifying the nutritional impacts on adolescent girls due to having junk foods in Quetta of Pakistan and Lucknow, India was performed (Zamarud et al., 2015).

## **2.1 Reasons for junk food popularity**

There are lots of reasons that make junk food highly popular. A study on the reason behind the popularity of junk food was done by Miranda Hitti in 2008. In her study

- 92.3% of the total population said that junk foods are quick.
- 80.1% of the total participants said that they are easily available.
- 69.6% of respondents claimed to enjoy the taste of junk cuisine.
- 63.3% of respondents claimed that fast cuisine is cheap.
- I'm too busy to prepare, claimed 53.2% of respondents.
- It's a "treat" for myself, 50.1% of respondents said.
- I don't like to make my own food, claimed 44.3% of respondents.
- 41.8% of respondents said that their peers and family approve of them.
- It is a means of socializing with friends and family, according to 33.1% of participants.
- 20.6% of the participants said that junk foods had many benefits.

The researcher additionally discovered that participants with college degrees preferred the answer "I'm too busy to cook" more than participants with less formal education (Hitti, 2008).

## **2.2 Measures to assess nutritional status**

### **Anthropometric assessment**

Anthropometric assessment is done by measuring the BMI or body Mass Index by a formula:-

$$\text{BMI} = \text{Weight in kg} / \text{Height in meter}^2$$

### **Body mass index (BMI)**

Body mass index (BMI) is calculated by dividing a person's weight in kilos by their height in meters squared. (Nuttall, 2015). For weight groups like underweight, healthy weight, overweight, and obesity, BMI is an economical and simple screening tool (CDC, 2020).



According to the World Health Organization (WHO) and the Center for Disease Control and Prevention (CDC), BMI classification for children, adolescents and adults is given below:-

BMI classification	WHO perc. scores for children and adolescents	CDC perc. scores for children and adolescents	BMI (kg.m <sup>2</sup> ) for adults
Underweight	< 15	< 5	< 18.5
Normal weight	≥ 15 to < 85	≥ 5 to < 85	≥ 18.5 to < 25
Overweight	≥ 85 to < 97	≥ 85 to < 95	≥ 25 to < 30
Obesity	≥ 97	≥ 95	≥ 30

**Figure 1. BMI Chart** (Kolimechkov & Petrov, 2020)

Again, the BMI index is very different for kids and adolescents aged 5 to 19 years. Standard Deviation Unit or Z scores are used to determine the BMI index for kids and adolescents aged 5 to 19 years. The disparity between a person's value and the median value of the reference population for their age or height, divided by the standard deviation of the reference population, is known as the Z-score or standard deviation unit (SD) (Cole et al., 2005). This can be written in an equation form as:

$$\text{Z-score(SD-Score)} = \frac{(\text{Observed value}) - (\text{median reference value})}{(\text{Standard deviation of reference population})}$$

In this research study, charts for boys and girls to identify the BMI score from the SD or Z score recommended by WHO are given here: -

### **BMI-for-age (5-19 years)**

#### **Interpretation of cut-offs**

Overweight: >+1SD (equivalent to BMI 25 kg/m<sup>2</sup> at 19 years)

Obesity: >+2SD (equivalent to BMI 30 kg/m<sup>2</sup> at 19 years)

Thinness: <-2sd>

Severe thinness: <>

## BMI-for-age GIRLS

5 to 19 years (z-scores)

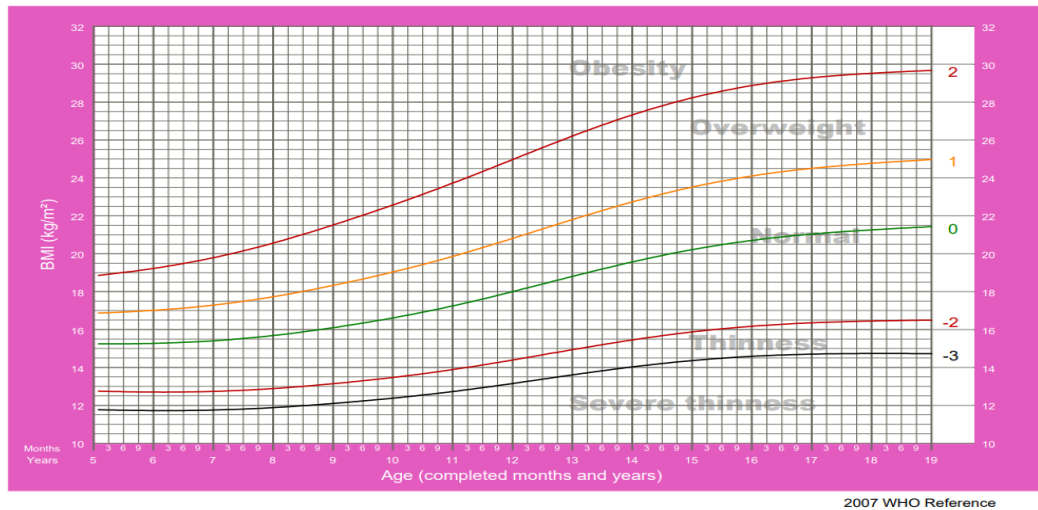


Figure 2 BMI-for-age GIRLS

## BMI-for-age BOYS

5 to 19 years (z-scores)

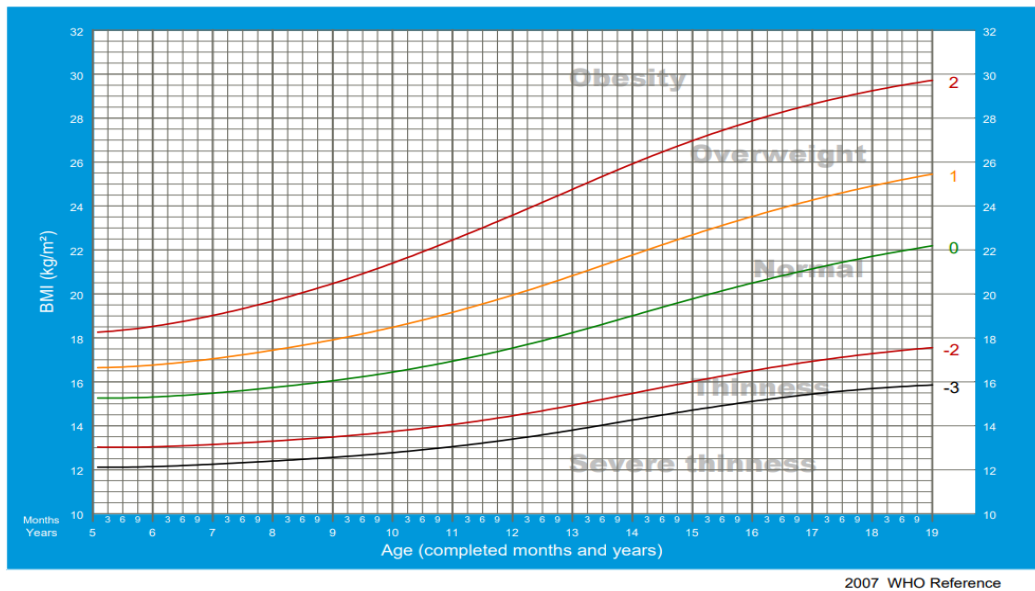


Figure 3 BMI-for-age Boys

After analyzing the graphs of BMI for age for girls and boys, a BMI index according to  $\text{kg/m}^2$  has been created according to the age of boys and girls.

For early adolescents of <14 years, the BMI range is:-

**Table 1 BMI Range for Early Adolescents**

<b>Severe thinner</b>	<14 kg/m <sup>2</sup>
<b>Thinner</b>	14-17 kg/m <sup>2</sup>
<b>Normal</b>	17-21.5 kg/m <sup>2</sup>
<b>Overweight</b>	21.5-25.5 kg/m <sup>2</sup>
<b>Obese</b>	>25.5 kg/m <sup>2</sup>

For middle adolescents of 14-16 years, the BMI ranges are:-

**Table 2 BMI Range for Late Adolescents**

<b>Severe thinner</b>	<14.5 kg/m <sup>2</sup>
<b>Thinner</b>	14.5-17 kg/m <sup>2</sup>
<b>Normal</b>	17-23 kg/m <sup>2</sup>
<b>Overweight</b>	23-26 kg/m <sup>2</sup>
<b>Obese</b>	>26 kg/m <sup>2</sup>

For late adolescents of 17-19 years, the BMI ranges are:-

**Table 3 BMI Range for Late Adolescents**

<b>Severe thinner</b>	<16 kg/m <sup>2</sup>
<b>Thinner</b>	16-18 kg/m <sup>2</sup>
<b>Normal</b>	18-25 kg/m <sup>2</sup>
<b>Overweight</b>	25-29 kg/m <sup>2</sup>
<b>Obese</b>	>29 kg/m <sup>2</sup>

(World Health Organization, 2007)

### **Physical activity**

Different types of physical activity that make people healthier are exercise, playing, walking, meditation, yoga, cycling, etc (Dinger & Waigandt, 2016). In accordance to a news article, 66% of Bangladeshi adolescents do not engage in enough physical activity. WHO guidelines state that people of all ages should engage in at least one hour of physical exercise each day, such as walking, playing, riding a bike, or participating in organized sports. The advantages of regular exercise, according to doctors, ranging from better heart and respiratory health to improved cognitive abilities that facilitate learning. Dr Lelin

Chowdhury said to the Business Standard that mobile and laptops are the two most risk factors that have reduced the physical activity level of adolescents. Furthermore, she stated that multi-sectoral action is required to create opportunities for young people to be active in order to improve levels of physical activity among children and adolescents (Tajmim, 2019).

### **Assessment of dietary intake**

The collection of data on the food and beverages eaten over a specific period of time is included in dietary assessment. Using food composition charts, the data is coded and analyzed to determine how much energy, nutrients, and other dietary components are consumed. (Spronk et al., 2014). Many different dietary intake techniques are employed, including the 24-hour dietary memory method and the 7-day dietary recall technique, among others (Cena & Calder, 2020).

### **Recommended dietary allowance**

The Recommended Dietary Allowances (RDA) are the recommended daily amounts of nutrients for almost all healthy people in a specific age and gender category. (Council, 1989). RDA stands for Recommended Dietary Allowance, which is the amount of food that should be consumed on a daily basis in order to satisfy the nutritional needs of almost all (97-98%) healthy people. (Munoz et al., 1997). For teenagers, the recommended daily allowance (RDA) is 0.5mg per 1000 kcal (Suzanne P Murphy, 2006).

### **2.3 Association of junk food and human diseases**

According to Bohara and his peers' study, consuming junk food in large quantities during puberty may affect brain development and result in lifelong poor eating habits. (Bohara et al., 2021). Additionally, long-term consumption of a low-quality, junk-food-heavy diet has been linked to an increased chance of obesity, depression, digestive problems, heart disease, polycystic ovarian disease, hypertension, malnutrition, stroke, type 2 diabetes, cancer, and early mortality.

### **Poor quality diet**

Consuming lower-quality foods such as highly processed snacks, sugar-sweetened drinks, refined (white) grains, refined sugar, fried foods, foods high in saturated and trans fats, and high-glycemic foods like potatoes are referred to as eating a poor-quality diet (Swift & Tischler, 2010).

## **Obesity**

Obesity is defined as having too much body fat, which raises your chance of developing other health issues. Obesity is defined as having a body mass index (BMI) of 30 or higher, while overweight is defined as having a BMI of 25 to 30 (Fruh, 2017).

## **Depression**

Depression is a mood situation resulting in enduring sadness, emptiness, and loss of joy. It is distinct from the mood swings that people typically encounter as a regular aspect of life (Sangsefidi et al., 2020). Junk food can contribute to issues with anxiety and sadness. In 2012, researchers at the Universities of Granada and Las Palmas de Gran Canaria conducted studies on this topic. They discovered that consuming fast food (hamburgers, hotdogs, and pizza) and commercially baked products (fairy cakes, croissants, doughnuts, etc.) is strongly associated with depression (Plataforma SINC, 2012).

## **Digestive issues**

A digestive disorder is any illness that affects the digestive system. Mild to severe conditions can exist. Heartburn, cancer, irritable bowel syndrome, and lactose sensitivity are a few typical issues (Dawson et al., 1997). More junk foods or fast foods eating also disturbs the digestive system. Eating junk foods very often rather than home-cooked foods gradually weakens the digestion process as well as causes bloating/gas, acidity, poor appetite etc (Octaria et al., 2020).

## **Heart disease**

A form of the illness called heart disease affects the heart or blood vessels. Smoking, high blood pressure, high cholesterol, an unhealthy diet, inactivity, and obesity all have the potential to raise one's chance of developing certain heart diseases (Keys, 1975).

## **Polycystic ovarian syndrome**

In the condition known as polycystic ovary syndrome (PCOS), the ovaries generate an excessive quantity of androgens, which are male sex hormones that are typically present in women in small amounts. The term polycystic ovary syndrome refers to the condition in which the ovaries develop a large number of tiny cysts (fluid-filled sacs) (Ndefo et al., 2013).

## **Hypertension & Stroke**

Hypertension, another name for excessive blood pressure, is elevated blood pressure. It can cause serious health issues, and raise your chance of heart disease, stroke, and even death. (Beilin, Puddey, & Burke, 1999). A CDC research using the 2017 American Academy of Pediatrics (AAP) Clinical Practice Guideline reveals that 1 in 25 adolescents aged 12 to 19 has elevated blood pressure, also known as prehypertension, and 1 in 10. Youth with fat are more likely to have high blood pressure (Khoury & Urbina, 2021).

## **Malnutrition**

When the diet is deficient in the necessary nutrients, malnutrition, a severe condition, results. It implies "poor nutrition," which includes undernutrition and inadequate nutrient intake. receiving more minerals than necessary, or overnutrition. Undernutrition (wasting, stunting, and underweight), insufficient vitamins and minerals, overweight, obesity, and the ensuing noncommunicable illnesses linked to diet are all types of malnutrition (Puntis & WL, 2010).

## **Type-2 Diabetes**

A prevalent disease called type 2 diabetes makes the amount of sugar (glucose) in the blood rise too high. It may result in signs like extreme thirst, frequent urination, and fatigue. Additionally, it can raise your risk of developing severe eye, heart, and nerve issues (Felber & Golay, 2002).

## **Cancer**

When abnormal cells develop uncontrollably, cross their normal boundaries to invade nearby body parts and/or spread to other organs, they are considered to be one of the many diseases known as cancer. Cancer can begin in almost any organ or tissue of the body. (Hassanpour & Dehghani, 2017). Testicular cancer, Hodgkin lymphoma, and primary bone cancer are among the cancers that are most commonly diagnosed in adolescents and young adults. The chance of colorectal, respiratory tract (lips, mouth, tongue, nose, throat, vocal cords, and part of oesophagus and windpipe) and stomach cancers were greater in people who consumed the most junk food.

## **Early Death**

Death happens earlier than the population's average death age. Numerous studies have found that consuming too much junk food can increase the risk of heart disease and early

mortality. Eating too much junk food creates several types of severe harmful diseases which result in decreasing human's life-expectancy (Vinay Gopal et al., 2012).

### **Junk food in Bangladesh**

In Bangladesh's cities, eating junk food is growing more and more prevalent. Junk food has become highly available now not only in cities but also in rural areas of Bangladesh. Rising hotels, restaurants, and street food shops and the lucrative food items of this sector attract customers more. Moreover, most of the females in the cities and rural areas have become working people. Due to workload, they prefer food from outside instead of cooking at home. Again, these lucrative food items attract children and adolescents more. Furthermore, Maximum adolescent students prefer eating food by purchasing in front of schools and colleges instead of bringing it from home. And by consuming junk food they suffer from various types of serious health diseases. In an interview, Dr Jahan warned that the rise in childhood and adolescent obesity in Bangladesh places these people at risk for a number of diseases, including diabetes, hypertension, and coronary heart disease (*Obesity on Rise in Bangladesh Children Owing to Junk Food, Unhealthy Lifestyles, 2022*).

## **Chapter-3: Methodology**

### **3.1 Study Area**

Chattogram is the port city of Bangladesh and it is the second biggest city of country. The study will be carried out at the One Health Institute, Chattogram Veterinary and Animal Sciences University, Chattogram. There are over 100 schools like pre-primary schools, primary schools, and secondary schools and 80 colleges in Chattogram City. The research study was done in two schools and colleges of Chattogram.

### **3.2 Ethical Implications**

During conducting the study, no pressure or persuasion was used to get answers out of the participants. Participants received a briefing on the study's goals, methods, and implications. All participants gave their written permission after being fully informed. A printed handout containing comprehensive study-related material was read out loud and explained in the local tongue. All information, including the right to remain anonymous and the option to withdraw from the research, was specifically disclosed. The Chattogram Veterinary and Animal Sciences University's ethics committee granted institutional clearance. The project has received clearance from the CVASU Ethics Committee under Memo no. CVASU/Dir(R&E)EC/2022/405/17 (**Appendix: page 49**).

### **3.3 Study design**

For conducting the study, a cross-sectional study was done on school and college adolescents whose ages ranged from 14-19 years. 2 schools and 2 colleges were selected randomly for conducting the research among all the schools and colleges in the Chattogram metropolitan area. The selected schools and colleges are Housing and Settlement Public School, Haliashahar; CIDER International School, Mojaffar Nagar; Cambrian College, Haliashahar; and Pahartali University College, Pahartali in Chattogram metropolitan area.

In these schools and colleges, students from 9th, 10th, 11th And 12th classes are selected to collect information from students. From these classes, students are selected randomly to conduct the survey program. The cross-sectional study was conducted from January 2022 to October 2022. Data were collected through a pre-tested questionnaire. It included general information, demographic information, and dietary information of participants (**Appendix, page: 39-46**).

The first part of the questionnaire included general information like the name, address, age group, gender, marital status and contact number of participants.



The second part as well as Demographic information included the class level, parent's occupation, parent's education level, family type, and living type of the participants.

The third section included clinical information like height, weight, exercise type, medical history, etc of the participants.

The fourth part of the questionnaire included the dietary habits of the participants, frequency of consuming junk food, influences on junk food intake, frequency of balanced diet practice, etc. A 7-day dietary recall method was used to collect data on food consumption.

### **3.4 Study population**

This study recruited school and college-going adolescents studying in grades 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> of selected schools and colleges of the Chattogram metropolitan area. This research excluded physically challenged, visually impaired, and school and college students who only had male or female cohorts, respectively.

### **3.5 Sample size calculation**

A total number of 390 samples were collected and the sample size was collected according to a previously published article (Bohara et al, 2021) as below: -

Sample size estimation formula:

For an unlimited population,  $n = \frac{Z^2 * p (1 - p)}{C^2}$

Here, Z= Z score(1.96), C=margin of error(0.05), p= population proportion(0.50), Confidence Interval= 95%.

So, Sample Size,  $n = \frac{(1.96 * 1.96) \{0.50(1-0.50)\}}{(0.05 * 0.05)}$

The estimated sample size was 385.

### **3.6 Data collection**

Adolescent pupils were given questionnaires directly to fill out during the course of the school day, and they had between 30 and an hour to do so. The principals and vice principals of the chosen educational institutions consented before data from the participants was collected. Before answering the questionnaire, the subject's consent was also obtained. Participants were made aware of the study's objectives, the confidentiality of their responses, and the lack of right and wrong before the data was collected. Their most recent week's eating habits were described using seven-day dietary recall methods.

The information was gathered in the Chattogram Metropolitan region between September 6 and October 25, 2022.

### 3.7 Data collection tool

Prior to the final data gathering, the questionnaire was pretested and validated. The factors that speed up the consumption of junk food have been reported in a thorough literature review and tool that was created after looking at related literature. The application was first created in English and then converted into Bangla. For the CIDER International School, the English version of the questionnaire was used. Professors and nutritionists evaluated and provided advice on linguistic validation and context validation prior to pretesting.

### 3.8 Categorization of obese and non-obese participants

According to the World Health Organization's advice, the Body Mass Index of adolescent boys and girls was determined based on their age. According to the recommendation,

- For **early adolescents** of <14 years, the BMI range is:-

Severe thinner:	<14 kg/m <sup>2</sup>
Thinner:	14-17 kg/m <sup>2</sup>
Normal:	17-21.5 kg/m <sup>2</sup>
Overweight:	21.5-25.5 kg/m <sup>2</sup>
Obese:	>25.5 kg/m <sup>2</sup>

- For **middle adolescents** of 14-16 years, the BMI ranges are:-

Severe thinner :	<14.5 kg/m <sup>2</sup>
Thinner:	14.5-17 kg/m <sup>2</sup>
Normal:	17-23 kg/m <sup>2</sup>
Overweight:	23-26 kg/m <sup>2</sup>
Obese:	>26 kg/m <sup>2</sup>

- For **late adolescents** of 17-19 years, the BMI ranges are:-

Severe thinner:	<16 kg/m <sup>2</sup>
Thinner:	16-18 kg/m <sup>2</sup>
Normal:	18-25 kg/m <sup>2</sup>
Overweight:	25-29 kg/m <sup>2</sup>
Obese:	>29 kg/m <sup>2</sup>

(WHO, 2007).

In the study, according to the recommendation of WHO, we decided to **categorize BMI <14 to ≤29 kg/m<sup>2</sup> as non-obese and BMI >29 kg/m<sup>2</sup> as obese**

### **3.9 Statistical analysis**

After data gathering, the collected data were kept in a Microsoft Excel-19 ® spreadsheet. To analyze epidemiological statistics, the data were imported into STATA-17® (STATA Crop, 4905, Lake Way Drive, College Station, Texas 77845, USA). To determine the proportionate prevalence of becoming obese and the danger of doing so among junk food consumers, descriptive analysis was conducted. To determine the relationship between the chance of developing obesity and various socioeconomic and health-related factors in the adolescents or participants, a Chi-Square test was used. The univariate model's significant level of p-value 0.05 was used to decide which factors should be included in the multivariate analysis. A forward selection method was used to estimate a multivariate logistic regression model. By introducing or removing a variable from the model and analyzing the changes in coefficients, the confounding impact of the variables was examined. Finally, the Receiver Operating Characteristic (ROC) curve was used to assess the model's predictive power. The final model's p-value of 0.05 was taken into consideration to show the potential risk factors of becoming obese as well as the impact of junk food intake on adolescent nutritional status. The odds ratio (OR), p-value, and 95% confidence interval were used to describe the logistic regression model's outputs. (CI).

## Chapter-4:Results

### 4.1 Univariate association of binary response of obesity with the associated factors

The overall consumption of junk food in adolescents (both school and college goers) was 100% (demographic data highlighted in **Table 10, Appendices, Page: 37-38**). Among the study population (N=390), 8% (95% CI: 5.54 – 11.11) of the participants were found obese. The univariate association of the binary response of obesity with the associated factors was presented in **Table 4** and **Table 5**.

According to the study location, it was found that a higher prevalence of developing obesity due to junk food consumption was recorded in students of CIDER International School (15.71%, 95% CI: 8.11 – 26.38) than in other study locations, followed by the Housing and Settlement Public School (11.67%, 95% CI: 6.53 – 18.8), Cambrian College (4%, 95% CI: 1.1 – 9.92), and Pahartali College (3%, 95% CI: 0.62 – 8.52) (**Table 4**).

In terms of gender, a higher prevalence of developing obesity was seen in male students (10.86%, 95% CI: 7.08-15.73) in comparison to female participants (4.73%, 95% CI: 2.06-9.11) (**Table 4**).

Adolescent students aged  $\leq 16$  years (12.72%, 95% CI: 8.14-18.62) had a higher prevalence of developing obesity with junk food consumption than adolescent students of 17-19 years old (4.61%, 95% CI: 2.23-8.31) (**Table 4**).

The level of education of adolescent students had a positive association with obesity. It was observed that students of secondary level (13.16%, 95% CI: 8.7-18.81) had a higher prevalence of developing obesity with junk food intake than the students of higher secondary level (3.5%, 95%: 1.42-7.08) (**Table 4**).

Parents' occupation of adolescent students was associated with the consumption of junk food by their offspring. It was revealed that students of service-holding mothers (16.3%, 95% CI: 9.42-25.46) had a higher prevalence of developing obesity than students whose mothers are housewives (5.7%, 95% CI: 3.36-8.98). Similarly, according to the fathers' occupation of participants, the highest prevalence was reported in those participants whose fathers were in service ( 11.44%, 95% CI: 7.68-16.21) had a higher prevalence of developing obesity than in participants whose fathers were involved in various types of businesses (3.25%, 95% CI: 1.06-7.41) (**Table 4**).

**Table 4: Univariate association of binary response of obesity with the associated Demographic factors**

Variable	Category	n, Prevalence (%)	95% CI	p-value (chi-square)
College	Pahartali University College (100)	3 (3)	0.62 – 8.52	<b>0.004</b>
	Cambrian College (100)	4 (4)	1.1 – 9.92	
	Housing and Settlement Public School (120)	14 (11.67)	6.53 – 18.8	
	CIDER International School (70)	11 (15.71)	8.11 – 26.38	
Gender	Female (169)	8 (4.73)	2.06 – 9.11	<b>0.029</b>
	Male (221)	24 (10.86)	7.08 – 15.73	
Age	17 – 19 (217)	10 (4.61)	2.23 – 8.31	<b>0.004</b>
	≤ 16 (173)	22 (12.72)	8.14 – 18.62	
Education	Higher Secondary (200)	7 (3.5)	1.42 – 7.08	<b>0.001</b>
	Secondary (190)	25 (13.16)	8.7 – 18.81	
Occupation of Mother	Housewife (298)	17 (5.7)	3.36 – 8.98	<b>0.01</b>
	Service (92)	15 (16.3)	9.42 – 25.46	
Occupation of Father	Business (154)	5 (3.25)	1.06 – 7.41	<b>0.004</b>
	Service (236)	27 (11.44)	7.68 – 16.21	
Education of Mother	Up to Secondary (95)	4 (4.21)	1.16 – 10.43	<b>0.000</b>
	Higher Secondary (192)	7 (3.65)	1.48 – 7.37	
	Graduation (103)	21 (20.39)	13.09 – 29.46	
Education of Father	Up to Secondary (46)	0	0 – 7.71	<b>0.000</b>
	Higher Secondary (176)	8 (4.55)	1.98 – 8.76	
	Graduation (168)	24 (14.29)	9.37 – 20.51	
Types of family	Nuclear family (342)	27 (7.89)	5.27 – 11.28	0.551
	Joint Family (48)	5 (10.42)	3.47 – 22.66	
Living with Parents	No (11)	0	0 – 28.49	0.314
	Yes (379)	32 (8.44)	5.85 – 11.71	

On the basis of the mother's education of participants, the percentage of developing obesity in students was reported higher in participants whose mothers completed graduation (20.39%, 95% CI: 13.09-29.46) than in other education levels of participants' mothers like higher secondary level (3.65%, 95% CI: 1.48-7.37), up to secondary level (4.21%, 95% CI: 1.16-10.43). According to the education of the fathers of participants, we found that participants whose fathers completed graduation (14.29%, 95% CI: 9.37-20.51) had a higher prevalence of developing obesity than other education levels of participants' fathers like higher secondary level (4.55%, 95% CI: 1.98-4.76), up to secondary level (0, 95% CI: 0-7.71). Again, students who lived in a joint family (10.42%, 95% CI: 3.47-22.66)

had a higher risk of developing obesity than students who lived in a nuclear family (7.89%, 95% CI: 5.27-11.28) (**Table 4**).

According to the usage of electronic devices, participants who used electronic devices for 1 hour or less than 1 hour (9.82%, 95% CI: 5.72-15.45) had a higher prevalence of developing obesity than others like 2-3 hours (6.41%, 95% CI: 3.12-11.47), more than 3 hours (8.45%, 95% CI: 3.16-17.49) (**Table 5**).

**Table 5: Univariate association of binary response of obesity with different lifestyle-related factors**

Variable	Category	n, Prevalence (%)	95% CI	p-value (Chi Square)
Performing Exercise	Yes (275)	25 (9.09)	5.97 – 13.13	0.324
	No exercise	7 (6.09)	2.48 – 12.14	
Type of Exercise	Walking (109)	6 (5.5)	2.05 – 11.6	0.267
	Playing (245)	21 (8.57)	5.38 – 12.8	
	Meditation (36)	5 (13.89)	4.67 – 29.5	
Usage of Electronic Device (Hours/Day)	1 or less than 1 (163)	16 (9.82)	5.72 – 15.45	0.539
	2 to 3 (156)	10 (6.41)	3.12 – 11.47	
	More than 3 (71)	6 (8.45)	3.16 – 17.49	
Pre-Medical Condition	Diabetes (1)	0	0 – 97.5	0.738
	High Blood Pressure (3)	0	0 – 70.76	
	Irregular Menstruation (10)	1 (10)	0.25 – 44.5	
	Low Blood Pressure (4)	0	0 – 60.24	
	Obesity (3)	1 (33.33)	0.84 – 90.57	
	Undernutrition (3)	0	0 – 70.76	
	Others (366)	30 (8.2)	5.6 – 11.49	

The study findings demonstrated that participants who did exercise (9.09%, 95% CI: 5.97-13.13) had a higher prevalence of developing obesity than participants who didn't exercise (6.09%, 95% CI: 2.48-12.14). On the basis of the type of exercise, students who performed meditation (13.89%, 95% CI: 4.67-29.5) had a higher prevalence of developing obesity than other types of exercises like playing (8.57%, 95% CI: 5.38-12.8), walking (5.5%, 95% CI: 2.05-11.6) (**Table 5**).

Based on the types of junk food, it was found that participants who ate fast food (14.95%, 95% CI: 8.79-23.14) had a higher prevalence than participants who eat other types of junk food. On the basis of the level of junk food consumption, who consume junk food 2-3 times per week (9.69%, 95% CI: 6.17-14.31) had a higher risk of developing obesity than other participants' level of junk food consumption. Yet again, those who consume junk

food with parents ( 12.68%, 95% CI: 5.96-22.7) had a higher prevalence of developing obesity than other participants. Similarly, participants who consume junk food in college/school (13.29%, 95% CI: 8.19-19.97) had a higher risk of developing obesity than other participants. On the basis of the system of purchasing junk food, participants who purchased junk food via food app (15.56%, 95% CI: 6.49-29.46) had a higher risk of developing obesity than other participants (**Table 6**).

**Table 6: Univariate association of binary response of obesity with the different food habit-related factors**

Variable	Category	n, prevalence (%)	95% CI	p-value, (Chi Square)
Types of Junk Food	Sweets (36)	1 (2.78)	0.07 – 14.53	<b>0.025</b>
	Salty Food (17)	1 (5.88)	0.15 – 28.69	
	Fast Food (107)	16 (14.95)	8.79 – 23.14	
	All (230)	14 (6.09)	3.37 – 10	
Level of Consuming Junk Food(Per week)	<2 (122)	7 (5.74)	2.34 – 11.46	0.428
	2 – 3 (227)	22 (9.69)	6.17 – 14.31	
	≥ 4 (41)	3 (7.32)	1.54 – 19.92	
Times of Junk Food Consumption	During Occasion/Travelling (54)	2 (3.7)	0.45 – 12.75	0.294
	With Friends (215)	16 (7.44)	4.31 – 11.8	
	With Parents (71)	9 (12.68)	5.96 – 22.7	
	No Fixed Time (50)	5 (10)	3.33 – 21.81	
Place of Junk Food Consumption	Home (34)	1 (2.94)	0.07 – 15.33	<b>0.018</b>
	College/School (143)	19 (13.29)	8.19 – 19.97	
	Restaurants/Street (213)	12 (5.63)	2.94 – 9.63	
System of Purchasing Junk Food	Take away from Hotels or Restaurants (345)	25 (7.25)	4.74 – 10.51	<b>0.056</b>
	Food App (45)	7 (15.56)	6.49 – 29.46	
Amount of Junk Food Shop	> 10 (123)	5 (4.07)	1.33 – 9.23	<b>0.019</b>
	5 – 10 (161)	12 (7.45)	3.91 – 12.66	
	<5 (106)	15 (14.15)	8.14 – 22.26	
Awareness of Junk Food	Yes (387)	32 (8.27)	5.72 – 11.47	0.603
	No (3)	0	0 – 70.76	
Times of Eating Balanced Diet(Per day)	≤ 2 (222)	17 (7.66)	4.52 – 11.98	0.651
	> 2 (168)	15 (8.93)	5.08 – 14.3	
Money Expense for Junk Food(taka per week)	<50 (128)	14 (10.94)	6.11 – 17.67	0.152
	50-100 (173)	9 (5.2)	2.41 – 9.64	
	>100 (89)	9 (10.11)	4.73 – 18.33	

According to the amount of junk food shops near the study location, participants whose study location had <5 junk food shops near their institution (14.15%, 95% CI: 8.14-22.26) had a higher risk of developing obesity than others. On practising a balanced diet, our findings stated that participants who ate a balanced diet >2 times a day ( 8.93%, 95% CI: 5.08-14.3) had a higher risk of developing obesity than other participants. Again, participants who spent <50 Bangladeshi takas per week(10.94, 95% CI: 6.11-17.67) had a higher risk of developing obesity than other participants (**Table 6**).



#### 4.2 Gender-wise prevalence of junk food consumption and its association with obesity

In the study, the prevalence of developing obesity due to junk food consumption in Pahartali College, Cambrian College, Housing and Settlement Public School, and CIDER International School was higher in males than in female students. The overall obesity percentages of males and females adolescent students in the study are 46% and 24%. The obesity percentage of male adolescent students of 17-19 years was 19.35% and 4.69% in male adolescent students of  $\leq 16$  years in comparison to female adolescent students of the same age. The obesity percentage in male adolescent students of the secondary level was high (19.44%) than the male participants of higher secondary level (2.65%) (Table 7).

**Table 7: Gender-wise prevalence of junk food consumption and its association with obesity**

Variable	Category	Male		P-value	Female		P-value
		Number	Obesity, Percentages		Number	Obesity, Percentages	
Age	17 - 19	128	6, (4.69)	<b>0.001</b>	89	4, (4.49)	0.877
	$\leq 16$	93	18, (19.35)		80	4, (5)	
Occupation of Mother	Housewife	169	14, (8.28)	<b>0.027</b>	129	3, (2.33)	<b>0.008</b>
	Service	52	10, (19.23)		40	5, (12.5)	
Occupation of Father	Business	79	4, (5.06)	<b>0.039</b>	75	1, (1.33)	0.063
	Service	142	20, (14.08)		94	7, (7.45)	
Education of Mother	Up to Secondary	51	3, (5.88)	<b>0.000</b>	44	1, (2.27)	0.248
	Higher Secondary	110	4, (3.64)		82	3, (3.66)	
	Graduation	60	17, (28.33)		43	4, (9.3)	
Education of Father	Up to Secondary	29	0	<b>0.001</b>	17	0	0.392
	Higher Secondary	95	5, (5.26)		81	3, (3.7)	
	Graduation	97	19, (19.59)		71	5, (7.04)	
	Yes	214	24, (11.21)		165	8, (4.85)	
Performing Exercise	Yes	152	18, (11.84)	0.486	123	7, (5.69)	0.338
	No exercise	69	6, (8.7)		46	1, (2.17)	
Types of Junk Food	Sweets	21	1, (4.76)	0.110	15	0	0.2
	Salty Food	8	0		9	1, (11.11)	
	Fast Food	66	12, (18.18)		41	4, (9.76)	
	All	126	11, (8.73)		104	3, (2.88)	
Level of Consuming Junk Food (per week)	$<2$	68	4, (5.88)	0.258	54	3, (5.56)	0.693
	2 - 3	125	17, (13.6)		102	5, (4.9)	
	$\geq 4$	28	3, (10.71)		13	0	

Times of Junk Food Consumption	During Occasion/Travelling	30	1, (3.33)	0.117	24	1, (4.17)	0.968
	With Friends	122	11, (9.02)		93	5, (5.38)	
	With Parents	40	8, (20)		31	1, (3.23)	
	No Fixed Time	29	4, (13.79)		21	1, (4.76)	
Place of Junk Food Consumption	Home	18	1, (5.56)	0.072	16	0	0.239
	College/School	82	14, (17.07)		61	5, (8.2)	
	Restaurants/Street	121	9, (7.44)		92	3, (3.26)	
System of Purchasing Junk Food	Take away from Hotels or Restaurants	198	19, (9.6)	0.076	147	6, (4.08)	0.302
	Food App	23	5, (21.74)		22	2, (9.09)	
Amount of Junk Food Shop	> 10	77	3, (3.9)	0.002	46	2, (4.35)	0.921
	5 - 10	88	8, (9.09)		73	4, (5.48)	
	<5	56	13, (23.21)		50	2, (4)	
Awareness of Junk Food	Yes	220	24, (10.91)	0.726	167	8, (4.79)	0.751
	No	1	0		2	0	
Times of Eating Balanced Diet(Per day)	≤ 2	136	15, (11.03)	0.918	86	2, (2.33)	0.133
	> 2	85	9, (10.59)		83	6, (7.23)	
Money Expenses for Junk Food(taka per week)	<50	71	10, (14.08)	0.088	57	4, (7.02)	0.332
	50-100	92	5, (5.43)		81	4, (4.94)	
	>100	58	9, (15.52)		31	0	

According to the participants' mothers' occupations, both male and female participants were prevalent to obesity. But in this section, female participants were more significant to develop obesity due to junk food consumption. The obesity percentage was high among the female participants whose mothers were in service (12.5%) and the amount was 2.23% whose mothers were housewives. Based on the participants' fathers' occupations, male participants were significantly more prone to develop obesity than female adolescent students. The obesity percentage of male adolescent students whose fathers were in service was 14.08%. Again, based on the participants' fathers' education, male participants were more prevalent to obesity who consume junk food extensively than female participants. The obesity percentage was high in male adolescent students whose fathers completed graduation (19.59%) followed by higher secondary level (5.26%) and up to secondary

level(0%). According to the amount of junk food shops near participants' educational institutions, male adolescent students were at high risk of obesity than female participants who consume junk food extensively. The obesity percentage was high in the male adolescent students who had <5 junk food shops near their educational institutions and it was 23.21%. The male adolescent students who had 5-10 shops near their education institutions had 9.09% obesity and who had >10 junk food shops 3.9% (**Table 7**).

#### **4.3 Univariable logistic regression model of obesity with the associated factors**

The Univariable logistic regression model of obesity with the associated factors has been shown in **Table 8**.

In terms of gender, male participants were at a 2.45 times higher risk of suffering from obesity than females (**Table 8**).

According to the study, it was found that adolescent students  $\leq 16$  years old were at a 3.02 times higher risk of developing obesity than those of 17-19 years. Furthermore, participants of the second level had a 4.18 times higher risk for obesity due to junk food consumption than the participants of the higher secondary level (**Table 8**).

According to Parents' occupations, participants whose mothers were in service had 3.22 times higher risks for obesity than participants whose mothers were homemakers. Similarly, the highest risk of developing obesity was reported in those participants whose fathers were in service (OR=3.85) more than in participants whose fathers were in business (**Table 8**).

On the basis of the mother's education of participants, the prevalence of developing obesity in students was reported 5.83 times higher in participants whose mothers completed graduation than in other education levels of participants' mothers (**Table 8**).

**Table 8: Univariable logistic regression model of obesity with the associated factors**

Variable	Category	OR	95% CI	p-value
Gender	Female (169)	Ref		
	Male (221)	2.45	1.07 – 5.6	<b>0.034</b>
Age	17 – 19 (217)	Ref		
	≤ 16 (173)	3.02	1.39 – 6.56	<b>0.005</b>
Education	Higher Secondary (200)	Ref		
	Secondary (190)	4.18	1.76 – 9.91	<b>0.001</b>
Occupation of Mother	Housewife (298)	Ref		
	Service (92)	3.22	1.54 – 6.74	<b>0.002</b>
Occupation of Father	Business (154)	Ref		
	Service (236)	3.85	1.45 – 10.23	<b>0.007</b>
Education of Mother	Up to Secondary (95)	Ref		
	Higher Secondary (192)	0.86	0.25 – 3.02	0.815
	Graduation (103)	5.83	1.92 – 17.68	<b>0.002</b>
Types of Junk Food	Sweets (36)	Ref		
	Salty Food (17)	2.19	0.13 – 37.22	0.588
	Fast Food (107)	6.15	0.79 – 48.16	0.083
	All (230)	2.27	0.29 – 17.8	0.436
Place of Junk Food Consumption	Home (34)	Ref		
	College/School (143)	5.06	0.65 – 39.17	0.121
	Restaurants/Street (213)	1.97	0.25 – 15.66	0.521

In accordance with the type of junk food consumption, the prevalence was higher in participants who consumed fast foods (6.15) whereas it was found lower in participants who consumed all types of food(2.27), salty foods (2.19), and sweets. In accordance with the place of junk food consumption, the prevalence was found higher in participants who ate junk food at college/school (5.06) whereas it was found lower in participants who ate junk food at restaurants(1.97), and participants who ate junk food at home (**Table 8**).

#### 4.4 Multivariable logistic regression model of obesity with the associated factors

The multivariable logistic regression model of obesity with the associated factors has been presented in **Table 9**. In the multivariate logistic regression model, we identified the five potential risk factors for developing obesity associated with junk food consumption in the students of Pahartali College, Cambrian College, Housing and Settlement Public School, and CIDER International School. In our study, we found that male participants were more significant in developing obesity (OR:2.49) than female participants. Again participants whose mothers have completed graduation (OR:6.4) had more risk of developing obesity than other participants up to the secondary level (**Table 9**).

**Table 9: Multivariable logistic regression model of obesity with the associated factors**

Variable	Category	OR	95% CI	p value
Gender	Female (169)	Ref		
	Male (221)	2.49	0.99 – 6.24	<b>0.05</b>
Education of Mother	Up to Secondary (95)	Ref		
	Higher Secondary (192)	0.86	0.23 – 3.14	0.816
	Graduation (103)	6.4	1.98 – 20.64	<b>0.002</b>
Occupation of Father	Business (154)	Ref		
	Service (236)	4.71	1.59 – 13.91	<b>0.005</b>
Types of Junk Food	Sweets (36)	Ref		
	Salty Food (17)	3.47	0.16 – 75.47	0.428
	Fast Food (107)	10.48	1.16 – 95.12	<b>0.037</b>
	All (230)	2.75	0.31 – 24.29	0.362
Place of Junk Food Consumption	Home (34)	Ref		
	College/School (143)	15.5	1.65 – 145.36	<b>0.016</b>
	Restaurants/Street (213)	5.99	0.63 – 56.97	0.119

**N.B: Female reference was selected because the prevalence of female was lower than male for multivariate analysis.**

Then, participants whose fathers were in service (OR: 4.71) had more risk of developing obesity than other participants. Consuming fast food (OR : 9.08) than other types of junk food and taking junk food near the educational institute (OR: 12.51) than other places were identified as a higher risk of developing obesity in the students in the study area. Furthermore, participants who consumed junk food at colleges/schools had a higher odds ratio (15.99) than those who consumed junk food at restaurants/streets, and at home and they were highly significant to raise obesity (**Table 9**).

## Chapter-5:Discussion

Unhealthy food consumption among all ages of people including adolescents is regrettably on the rise, and this is linked to a higher risk of inadequate nourishment. Junk food is frequently low in vital vitamins and minerals and high in calories, sugar, and fat. Junk food consumption has been related to an increased possibility of adolescent obesity and overweight. As adolescence is the most important period of the human life cycle, it is essential for a person to eat healthy food for the welfare of the following generation.

In this research study from Chattogram City, Chattogram, Bangladesh, it was found that most participants were middle adolescents and late adolescents. Very few participants were early adolescents. Maximum students lived with their parents and in the nuclear family. The age range of middle adolescents is 14-16 years and the age range of late adolescents is 17-19 years. In the study, we found 8% (n=32) obese participants and 92% (n=358) under-obese participants. There were 57% of male students and 43% of female students participated in the study.

A cross-sectional study was performed to analyze the association between junk food consumption and obesity in male and female adolescents. In the research investigation, four highly significant factors were found associated to causing obesity due to high junk food consumption. These factors were the gender, participants' mothers education level, participants' fathers occupation, types of junk food adolescent participants chose to eat, place of junk food consumption of the participants.

It was found that male students (57%) consumed more junk food than female students (43%) and they were highly significant to obesity. One of the main reason for this was that most of the male adolescents didn't want bring tiffin from home. And this effect is present among all children and adolescents. Another reason for having junk food more was the male adolescents used to consume junk food more as a quick and convenient source of energy. Meanwhile, most of the female students preferred healthier food for having tiffin.

Again, the education of participants' mothers influenced the junk food consumption of participants greatly (20.39%) (OR: 6.26). Many of the students' mothers had completed graduation and most of them were service-holders. They found very less time to cook. For this, they found preferring junk food to provide their children instead of providing homemade food. As a result, they become more prevalent to developing obesity. On the other hand, participants whose mothers are housewives got enough time to cook food at home and they provided homemade food to their offspring for food consumption. Fathers'

occupations also created an impact on developing obesity in the participants. In the study of Bohara and his friends, it was found that both mothers' and fathers' educations and occupations were responsible for influencing the junk food consumption of adolescents (Bohara et al., 2021). Adolescent students whose fathers were involved in service were significant to consume junk food in high amounts and develop obesity. Fathers who worked in the service sector might be more likely to have lower incomes and thus might not be able to give their kids healthier food choices. Adolescent participants became more inclined to ingest junk food as a result of this. Again fathers who involved in business could spend time with their offspring whenever they wanted. This facility used to help them to keep their offspring having healthy food and away from having junk food.

In the research project, it was also found that participants preferred fast food items (14.95%, OR: 9.08) more for consumption than salty item, sweets item or all sorts of item. Fast foods include chicken fry, burger, sandwich, hamburger, hot-dog, shwarma, pizza, etc. These foods are quick and convenient. These foods are found ready to eat and tasty. For this reason, the research program found that participants used to eat fast food more than any other junk food items. These fast food items hugely affects the individuals to develop obesity including various types of severe health disease like cancer, diabetes, gastric ulcer, heart disease, etc.

Again, participants preferred to have junk food more while in educational institutions (13.29%, OR: 12.51). The research study's adolescent participants preferred eating fast food in their schools or colleges more than other places. Because fast food is readily available quickly, and frequently less expensive than healthier alternatives. Furthermore, a lot of adolescent participants believed that they did not have much control over their diets when it came to what was offered to them in school or college. So junk food might have been a means for them to feel like they did.

After data analysing, it was found that adolescent students of CIDER International School (15.71%) consumed more junk food than other study locations. The research study after analysis showed that the maximum number of adolescent participants of CIDER International School belonged to rich societies. Most of the students' parents were involved in services and businesses. They used to find very less time to cook food at home and they used to prefer purchasing food from outside to give tiffin to their offspring. Moreover, Many parents used to provide 50-100 or >100 Bangladeshi takas to their children for purchasing food according to their choices. And it is known to all that students prefer food which are good looking and delicious whether the food has nutrition value not.

Furthermore, the consumption of junk food was found higher in Middle adolescents (12.72%) than in Late adolescents (4.61%). Middle adolescents ( $\leq 16$  years) indicate a developmental period with a stronger desire for independence and autonomy. This desire for independence and autonomy frequently results in trying with various foods and taking risks in the middle-age-adolescents. As a result, they might be more inclined to seek out and eat junk food than late-age adolescents, who are more inclined to be health-conscious and opt for healthier food choices. But in a study by Schmidt and his friends in America, it was shown that junk food consumption increase with age (Schmidt, et al., 2005).

Living situation, family type, performing exercises, using electronic devices, convenience, peer pressure, the availability of junk food, eating a balanced diet, spending money on junk food, the method of purchasing junk food, knowledge of the health effects of junk food consumption were also found independent variables or socio-demographic factors that were used to analyze the impact of junk food consumption on the nutritional status of adolescents.

Those who lived in intact families and with their parents had a higher tendency to overeat junk food and be obese. Similar research from the United States of America (USA) shows that people living at home with their parents or in a nuclear family have fewer frequent meals, poorer dietary consumption, and less access to home cuisine than people living on campus (Laska et al., 2011). In contrast to parents, peers had a bigger impact on junk food consumption. Participants when with their friends preferred junk food more than any other time.

All the students were aware of the bad impact of junk food consumption on their nutritional status. But still they used to have junk food. And those who ate a balanced diet 2-3 times per week had a high chance of developing obesity. Most of the participants used to purchase food via using the food app. This reduced their physical activity level and helped them to develop obesity.

Adolescents who ate a lot of junk food were more inclined to have behavioural issues and perform poorly in their educational institutions. Adolescents should be encouraged to adopt healthy eating habits and discouraged from consuming junk food in order to lower the chance of poor nutritional status.



## **Chapter-6: Conclusion**

Junk food harms body greatly. Eating too much junk food can cause several types of disease including cancer, heart disease, etc (Agarwal & Makhija, 2019). The results of our study showed that adolescents who were attending high school or college were eating more junk food. The poor growth outcomes may be caused by the rising junk food consumption. It was discovered that consumption was more common in restaurants, homes, workplaces, and institutions. Additionally, it was found that the individuals' greater reliance on junk food was more affected by their obligations to their families and friends. It was fascinating to see how media exposure through the use of electronic devices contributed to the promotion of junk food, with friend influence being the most significant of these factors.

In both secondary and higher-secondary students, the consumption of junk food was surprisingly high. Despite having sufficient information about the negative effects of junk food, secondary and higher secondary school students still consume it since it is readily available and comes in convenient packaging. The Bangladeshi government should carefully standardize and control advertising practices and exaggerated health claims made by junk food producers. It is advised to target adolescents with an appropriate intervention that is integrated with national nutrition policy in order to change their eating habits.

## **Chapter-7: Recommendation and Future Perspective**

Regular nutrient-rich food consumption can lower teen weight rates. Adolescent-friendly health and nutrition instruction provided by the community can help raise awareness of nutrition-related issues. Parental education programs on healthy eating, proper food preparation, and the detrimental effects of junk food intake may also help to lessen the burden of nutritional morbidity in this study area. Adolescent nutrition is influenced by better hygiene habits. Four distinct areas of the city of Chattogram were examined in this study, and the amount of material was modest. Future research is advised to cover a wider geographic range in order to increase the validity of results. A larger sample size for the study could produce more accurate findings regarding the prevalence and contributing factors of adolescent obesity. To reduce the rates of adolescent obesity in the study regions, community health extension workers should be strengthened with nutritional health instructors.

### **Limitations of the Study**

In every research, researchers have to face some limitations. Sometimes participants don't want to participate in the study. Sometimes, researchers find it difficult to collect accurate samples for the research. Political factors sometimes can be the reason for hampering a research program properly. Sometimes, participants don't participate in the study program properly and don't fill out the questionnaire perfectly.

## References

- Alam N, Roy SK, Ahmed AS, & Ahmed T. 2010. Nutritional Status, Dietary Intake, and Relevant Knowledge of Adolescent Girls in Rural Bangladesh. *Journal of Health Population and Nutrition*, 28(1): 86-94.
- Allen B, & Waterman H. 2019. Stages of Adolescence. Retrieved from American Academy of Pediatrics: <https://www.healthychildren.org/English/ages-stages/teen/Pages/Stages-of-Adolescence.aspx>
- Banik R, Naher S, Pervez S, & Hossain MM. 2020. Fast food consumption and obesity among urban college going adolescents in Bangladesh: A cross-sectional study. *Obesity Medicine*, 17.
- Beilin LJ, Puddey IB, & Burke V. 1999. Lifestyle and Hypertension. *the American Journal of Hypertension*, 12(9).
- Bohara SS, Thapa K, Bhatt LD, Dhama SS, & Wagle AS. 2021. Determinants of Junk Food Consumption Among Adolescents in Pokhara Valley, Nepal. *frontiers in Nutrition*, 8.
- Britannica TE. 2020. Food. Definition & Nutrition. Retrieved from Britannica: <https://www.britannica.com/topic/food>. [Accessed: 6 March 2023].
- Bohara SS, Thapa K, Bhatt LD, Dhama SS, & Wagle AS. 2021. Determinants of Junk Food Consumption Among Adolescents in Pokhara Valley, Nepal. *Frontiers in Nutrition*, 8.
- CDC. 2020. About Adult BMI. Retrieved from Center for Disease Control and Prevention: [https://www.cdc.gov/healthyweight/assessing/bmi/adult\\_bmi/index.html](https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html)
- Cena H, & Calder PC. 2020. Defining a Healthy Diet: Evidence for the Role of Contemporary Dietary Patterns in Health and Disease. *National Library of Medicine*, 12(2).
- Dawson KA, Rasmussen MA, & Allison MJ. 1997. Digestive disorders and nutritional toxicity. The rumen microbial ecosystem, 633-660.
- Dinger MK, & Waigandt A. 2016. Dietary Intake and Physical Activity Behaviors of Male and Female College Students. *American Journal of Health Promotion*, 11(5), 360-362.
- Felber JP, & Golay A. 2002. Pathways from obesity to diabetes. *International Journal of Obesity*, 26.
- Fruh SM. 2017. Obesity: Risk factors, complications, and strategies for sustainable long-term weight management. *Journal of the American Association of Nutrition*, 29.

- Hassanpour SH, & Dehghani M. 2017. Review of cancer from perspective of molecular. *Journal of Cancer Research and Practice*, 4(4).
- Hitti M. 2008. Top 11 Reasons for Fast Food's Popularity. Retrieved from WebMD: <https://www.webmd.com/food-recipes/news/20081202/top-11-reasons-for-fast-foods-popularity>
- Huq AO. 2012. *Human Nutrition and Applied Dietetics*. Dhaka.
- Islam MS, Rahman SS, Kamruzzaman M, Raza MS, Saifuzzaman M, Aktar MJ, & Hossain MS. 2015. Impact of Nutrition Education on Nutritional Status of Adolescent Girls in South-west Region of Bangladesh. *American Journal of Nutrition and Food Science*, 2(1), 1-6.
- Keys A. 1975. Coronary heart disease — The global picture. *Atherosclerosis*, 22(2).
- Kolimechkov S, & Petrov L. 2020. The Body Mass Index: A Systematic Review.
- Laska MN, Larson NI, Neumark-Sztainer D, & Story M. 2011. Does involvement in food preparation track from adolescence to young adulthood and is it associated with better dietary quality? Findings from a 10-year longitudinal study. *Public health nutrition*, 15(7).
- Li L, Sun N, Zhang L, Xu G, Liu J, Hu J, Hang L. 2020. Fast food consumption among young adolescents aged 12–15 years in 54 low- and middle-income countries. *Global Health Action*, 13(1).
- Malmi H, Mahdavi FS, Ejtahed HS, Kazemian E, Chaharrahi A, Khonsari NM, Mahdavi-Gorabi A, and Qorbani M. 2022. Junk food consumption and psychological distress in children and adolescents: a systematic review and meta-analysis. *Nutritional Neuroscience*, 1-21.
- Ndefo UA, Eaton A, & Green MR. 2013. Polycystic Ovary Syndrome. *National Library of Medicine*, 38(6).
- Pinatih GN. 2020. Healthy food to support healthy life. *Bali Medical Journal*, 9, 380-385.
- Plataforma SINC. 2012. Link between fast food and depression confirmed. Retrieved from ScienceDaily: <https://www.sciencedaily.com/releases/2012/03/120330081352.htm>
- Puntis & WL J. 2010. Malnutrition and Growth. *Journal of Pediatric Gastroenterology and Nutrition*, 51.
- Rehman G, Kakar A, Zarak MS, & Ahmad H. 2018. Effect of junk food on the nutritional status of children in quetta. *International Journal of Current Research*, 10(2).

- Sangsefidi ZS, Lorzadeh E, Hosseinzadeh M, & Mirzaei M. 2020. Dietary habits and psychological disorders in a large sample of Iranian adults: a population-based study. *Annals of General Psychiatry*, 19(1).
- Scaglioni S, Salvioni M, & Galimberti C. 2008. Influence of parental attitudes in the development of children eating behaviour. *British Journal of Nutrition*.
- Schmidt M, Affenito SG, Striegel-Moore R, Khoury PR, Barton B, Crawford P, Kronsberg S, Schreiber G, Obarzanek E, and Daniels S. 2005. Fast-food intake and diet quality in black and white girls: the National Heart, Lung, and Blood Institute Growth and Health Study. *Archives of pediatrics & adolescent medicine*, 159(7).
- Singla P, Sachdeva R, & Kochhar A. 2012. Effect of Nutrition Counseling on Junk Food Intake and Anthropometric Profile among Adolescent Girls of Working Mothers. *International Journal of Scientific and Research Publication*, 2(5).
- Spronk I, Kullen C, Burdon CA, & O'Connor HT. 2014. Relationship between nutrition knowledge and dietary intake. *The British Journal of Nutrition: an international journal of nutritional science*, 11(10).
- Suzanne P, Murphy SI. 2006. Recommended Dietary Allowances should be used to set Daily Values for nutrition labeling. *The American Journal of Clinical Nutrition*, 83(5).
- Swift JA, & Tischler V. 2010. Qualitative research in nutrition and dietetics. *Journal of Human Nutrition and Dietetics*, 23.
- Tajmim T. 2019. 66% Bangladeshi adolescents not sufficiently physically active. *The business standard*.
- White JV, & Tate MJ. 2001. Food & Fitness: Build a Healthy Lifestyle. *Journal Of The Academy of Nutrition and Dietetics*, 101(3).
- World Health Organization. 2007 . BMI-for-age (5-19 years). Retrieved from World Health Organization: <https://www.who.int/tools/growth-reference-data-for-5to19-years/indicators/bmi-for-age>
- Younis FH, & Eljamay SM. 2019. Fast Food Consumption among Teenagers Aged Between (13 To 25) Years Old and Their Effect on Health in Derna-Libya. *Maple Scientific*, 1(1), 1-8.
- Agarwal VV, & Makhija PA. 2019. A study on junk food consumption behavior among college students. *International Research Journal of Engineering and Technology (IRJET)*, 6(3), 4185–4192.
- Baig AK, & Saeed M. 2012. Review of trends in fast food consumption. *European Journal of Economics, Finance and Administrative Sciences*, 48, 77–85.

- Borraccino A, Lemma P, Berchiolla P, Cappello N, Inchley J, Dalmass, P, Charrier L, Cavallo F, & Group IH. 2010. 2016. Unhealthy food consumption in adolescence: Role of sedentary behaviours and modifiers in 11-, 13-and 15-year-old Italians. *The European Journal of Public Health*, 26(4), 650–656.
- Chapman G, & Maclean H. 1993. “Junk food” and “healthy food”: Meanings of food in adolescent women’s culture. *Journal of Nutrition Education*, 25(3), 108–113.
- Cole TJ, Faith MS, Pietrobell, A, & Heo M. 2005. What is the best measure of adiposity change in growing children: BMI, BMI%, BMI z-score or BMI centile? *European Journal of Clinical Nutrition*, 59(3), 419–425.
- Council NR. 1989. Recommended dietary allowances.
- Freedman DS, & Berenson GS. 2017. Tracking of BMI z scores for severe obesity. *Pediatrics*, 140(3).
- Khoury M, & Urbina EM. 2021. Hypertension in adolescents: Diagnosis, treatment, and implications. *The Lancet Child & Adolescent Health*, 5(5), 357–366.
- Kurz KM. 1996. Adolescent nutritional status in developing countries. *Proceedings of the Nutrition Society*, 55(1B), 319–331.
- Leroy JL, Ruel M, Sununtnasuk C, & Ahmed A. 2018. Understanding the determinants of adolescent nutrition in Bangladesh. *Annals of the New York Academy of Sciences*, 1416(1). <https://doi.org/10.1111/nyas.13530>
- Munoz KA, Krebs-Smith SM, Ballard-Barbash R, & Cleveland LE. 1997. Food intakes of US children and adolescents compared with recommendations. *Pediatrics*, 100(3), 323–329.
- Nuttall FQ. 2015. Body mass index: Obesity, BMI, and health: a critical review. *Nutrition Today*, 50(3), 117.
- Octaria Y, Apriningsih A, Dwiriani CM, & Februhartanty J. 2020. School readiness to adopt a school-based adolescent nutrition intervention in urban Indonesia. *Public Health Nutrition*. <https://doi.org/10.1017/S1368980020001299>
- Salam RA, Hooda M, Das JK., Arshad A, Lassi ZS, Middleton P, & Bhutta ZA. 2016. Interventions to Improve Adolescent Nutrition: A Systematic Review and Meta-Analysis. *Journal of Adolescent Health*, 59(2). <https://doi.org/10.1016/j.jadohealth.2016.06.022>
- Spronk I, Kullen C, Burdon C, & O’Connor H. 2014. Relationship between nutrition knowledge and dietary intake. *British Journal of Nutrition*, 111(10), 1713–1726.
- Vinay Gopal J, Sriram S, Kannabiran K, & Seenivasan R. 2012. Student’s perspective on junk foods: Survey. *Sudanese Journal of Public Health*, 7(1), 21–25.

- Zamarud K, Khan SA, Ramesh K, Qureshi MA, Ruqia R, & Safdar RM. 2015. Behaviour towards healthy food among students of private schools in Quetta, Pakistan. *Pakistan Journal of Public Health*, 5(1), 1–5.
- Franck C, Grandi SM, & Eisenberg MJ. 2013. Taxing Junk Food to Counter Obesity. *American Journal of Public Health*, 103(11), 1949–1953.
- Obesity on Rise in Bangladesh Children Owing to Junk Food, Unhealthy Lifestyles. <https://www.aa.com.tr/en/asia-pacific/obesity-on-rise-in-bangladesh-children-owing-to-junk-food-unhealthy-lifestyles/2525269>. Accessed 18 Mar. 2023.
- “Nearly Half the World’s Population ‘Suffers from Poor Nutrition.’” Nearly Half the World’s Population “Suffers from Poor Nutrition,” <https://www.trtworld.com/life/nearly-half-the-world-s-population-suffers-from-poor-nutrition-51920>. Accessed 15 Mar. 2023.

## Appendices

### Demographic data on junk food consumption in the study areas,

**Table 10 Demographic data of junk food consumption in the study areas**

Variable	Category	Number	Percentages
College	Pahartali University College	100	25.64
	Cambrian College	100	25.64
	Housing and Settlement Public School	120	30.77
	CIDER International School	70	17.95
Gender	Female	169	43.33
	Male	221	56.67
Age	17 - 19	217	55.64
	≤ 16	173	44.36
Education	Higher Secondary	200	51.28
	Secondary	190	48.72
Occupation of Mother	Housewife	298	76.41
	Service	92	23.59
Occupation of Father	Business	154	39.49
	Service	236	60.51
Education of Mother	Up to Secondary	95	24.36
	Higher Secondary	192	49.23
	Graduation	103	26.41
Education of Father	Up to Secondary	46	17.79
	Higher Secondary	176	45.13
	Graduation	168	43.08
Types of family	Nuclear family	342	87.69
	Joint Family	48	12.31
Living with Parents	No	11	2.82
	Yes	379	97.18
Time of Exercise(Per day)	Yes	275	70.51
	No exercise	115	29.49
Type of Exercise	Walking	109	27.95
	Playing	245	62.82
	Meditation	36	9.23
Usage of Electronic Device (Hours/Day)	1 or less than 1	163	41.79
	2 to 3	156	40
	More than 3	71	18.21
Pre-Medical Condition	Diabetes	1	0.26
	High Blood Pressure	3	0.77
	Irregular Menstruation	10	2.56
	Low Blood Pressure	4	1.03
	Obesity	3	0.77
	Undernutrition	3	0.77
	Others	366	93.85
Types of Junk Food	Sweets	36	9.23
	Salty Food	17	4.36
	Fast Food	107	27.44



	All	230	58.97
Level of Consuming Junk Food(Per week)	<2	122	31.28
	2 - 3	227	58.21
	$\geq 4$	41	10.51
Times of Junk Food Consumption	During Occasion/Travelling	54	13.85
	With Friends	215	55.13
	With Parents	71	18.21
	No Fixed Time	50	12.82
Place of Junk Food Consumption	Home	34	8.72
	College/School	143	36.67
	Restaurants/Street	213	54.62
System of Purchasing Junk Food	Take away from Hotels or Restaurants	345	88.46
	Food App	45	11.54
Amount of Junk Food Shop	> 10	123	31.54
	5 - 10	161	41.28
	<5	106	27.18
Awareness of Junk Food	Yes	387	99.23
	No	3	0.77
Times of Eating Balanced Diet(Per day)	$\leq 2$	222	56.92
	> 2	168	33.08
Money Expense for Junk Food(Per week)	1	128	32.82
	2	173	44.36
	$\geq 3$	89	22.82



7. What is your father's occupation?

- a) Service                      b) Business                      c) Others

8. What is your father's education level?

- a) Primary                      b) Secondary                      c) Higher Secondary  
d) Graduate                      e) Post Graduate                      f) Upper                      g) Others

9. What is your family type?

- a) Nuclear Family                      b) Joint Family                      c) Others

10. Whom do you live with?

- a) Parents                      b) Relatives                      c) Hostels                      d) Friends                      e) Alone                      f) Others

### Section 3

Please give tick (✓) marks where necessary. You may choose multiple answers where necessary.

11. What is your height? \_\_\_\_\_

12. What is your body weight? \_\_\_\_\_

13. How many times do you spend for exercise?

- a) 1-2 times                      b) 2-3 times                      c) No exercise                      d) Others

14. Which type of exercise do you perform most?

- a) Playing                      b) Walking                      c) Meditation                      d) Others

15. How many times do you spend in using mobile phones or laptops?

- a) <1 hour in a day                      b) 1 hour in a day                      c) 2-3 hours in a day  
d) 3-4 hours in a day                      e) >4 hours in a day                      f) Others

16. Do you have any medical history like, , , , etc.?

- a) High blood pressure                      b) Low blood pressure                      c) obesity                      d) Undernutrition  
e) diabetes                      f) Painful or irregular menstruation                      g) others

### Section 4

17. Do you consume junk food? (See Chart)

a) Yes

b) No

18. Which type of junk food do you eat most? (See Chart)

- a) Salty snacks                      b) Sweets                      c) Sweetened beverage                      d) Fast food                      e) All

19. How often do you consume junk food?
- a) >4 days in a week    b) 2-4 days in a week    c) <2 days in a week    d) Others
20. When do you consume junk food most?
- a) During travelling    b) During with friends    c) During occasion    d) During alone
- e) During with parents    f) Not fixed time    g) During studying    h) Others
21. Where do you eat junk food most?
- a) At home    b) On trip    c) At school    d) At friend's home
- e) At restaurants    f) At street food Stall    g) Others
22. From which source do you purchase junk food?
- a) Via take-away from the hotels or restaurants    b) Via food app
- c) Via dining in the hotels or restaurants    d) Others
23. How many hotels, restaurants or street shops are available near your school or college where junk foods are found?
- a) <5    b) 5-10    c) >10    d) Others
24. Do you know that junk food is harmful for health?
- a) Yes    b) No.
25. How many times do you take balanced diet? (See Chart)
- a) 1-2 times    b) 2-3-time    c) 4-5 times    d) Others
26. How much money do you expend weekly for having junk food?
- a) <50-taka    b) 50-100-taka    c) >100-taka    d) Others

### Balanced diet

Food filled with proper amount of carbohydrates, fats, vitamins, minerals, proteins, and fibre.

### Junk Food

Junk food is defined as a food that has very low nutrients and a lot of fat, sugar, and salt. Potato chips, candy, and soft drinks, etc are often considered junk food.

### Junk Food Chart

Salty snacks	Sweets	Sweetened beverage	Fast Food
Chips, Nachos, Nimkies, French fries, Potato Wadges, Potato Crackers, Dal Vaja, Salted Badam Vaja, Chanachur, Jhal Muri, Salted Biscuits, Salted Popcorn, etc.	Cake, Pastry, Doughnut, Sweet (like chamcham, white white red sweet, etc), Brownie, Apple Pie, Cup Cake, Butter Bun, Sweet Bun, Khabuj, Bakorkhani, Cream Bun, Chocolates, Wafers, Waffels, Sweet Biscuits, Cookies, Croissant, Sweet Popcorn, Muffin Cake, Dry Cake, etc.	Juices, Soft drinks like Pepsi, Mountain Dew, Coca-Cola, MaxCola, Sprite, 7UP, Ice cream, Coffee, Tea, Energy drinks, Milk Shakes, Strawberry Shake, Mango Shake, Chocolate shake, Soda, Lemonade, Mojito, etc.	Shingara, Samosa, Pizza, Burger, Chotpoti, Fuchka, Pasta, Noodles, Biryani, Chicken fry, Chicken chap, Chicken Tikka, Chicken Roll, Spring Roll, Wonton, Chicken nuggets, Beef Tikka, Dal puri, Alu puri, Keema puri, Sandwich, Bacon cheeseburger, Chicken Parata, Parata, Pani Puri, Mughlai Parata, Chicken Bun, Chicken Patties, Velpuri, Puri, Luchy, etc.

নমুনা নং.

**Effect of Junk Food Consumption on the Nutritional Status of Adolescents.**

(কিশোর-কিশোরীদের পুষ্টিস্থিতির উপর অপুষ্টিকর খাবার গ্রহণের প্রভাব।)

এই প্রশ্নপত্রটি ১৪-১৯ বছরের কিশোর-কিশোরীদের থেকে অপুষ্টিকর খাবার গ্রহণ সম্পর্কে প্রতিক্রিয়া জানার জন্য তৈরি হয়েছে। এই প্রশ্নপত্রটি কিশোর-কিশোরীদের অপুষ্টিকর খাবার গ্রহণের প্রবণতা ও পুষ্টিস্থিতি পরিমাপ করতে সহায়তা করবে। এই প্রশ্নপত্রটি সম্পূর্ণ পূর্ব পরিকল্পিত। এই প্রশ্নপত্রটিতে দেওয়া সকল তথ্য সম্পূর্ণ সংরক্ষিত থাকবে এবং শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে।

আপনি কি এই জরিপে অংশগ্রহণ করতে চান?

ক) হ্যাঁ

খ) না

যদি হ্যাঁ হয়, অনুগ্রহ করে প্রশ্নপত্রটি পূরণ কর-----

**প্রথম অংশ (সাধারণ তথ্য)**

নাম: \_\_\_\_\_

ঠিকানা: \_\_\_\_\_ (অপশনাল)

মোবাইল নং: \_\_\_\_\_ (অপশনাল)

ধাপে স্থানে দয়া করে টিক চিহ্ন (✓) দিন। আপনি সঠিক উত্তর হিসেবে কেবল মাত্র একটি উত্তরই নিতে পারবেন।

১। আপনার লিঙ্গ? পুরুষ  মহিলা

২। আপনার বয়স? <১৪  ১৪-১৬ বছর  ১৭-১৯ বছর

৩। আপনার শিক্ষাগত যোগ্যতা?

ক) মাধ্যমিক খ) উচ্চ মাধ্যমিক

৪। আপনি কি?

ক) বিবাহিত খ) অবিবাহিত গ) অন্যান্য

**দ্বিতীয় অংশ (জনতাত্ত্বিক তথ্য)**

ধাপে স্থানে দয়া করে টিক চিহ্ন (✓) দিন। আপনি সঠিক উত্তর হিসেবে কেবল মাত্র একটি উত্তরই নিতে পারবেন।

৫। আপনার মায়ের পেশা?

ক) গৃহিণী খ) চাকুরীজীবী গ) অন্যান্য

৬। আপনার মায়ের শিক্ষাগত যোগ্যতা?

ক) মাধ্যমিক খ) উচ্চমাধ্যমিক গ) স্নাতক ঘ) স্নাতকোত্তর ঙ) উচ্চতর চ) অন্যান্য

৭। আপনার বাবার পেশা?

ক) চাকুরীজীবী খ) ব্যবসায়ী গ) অন্যান্য

৮। আপনার পিতার শিক্ষাগত যোগ্যতা?

ক) মাধ্যমিক খ) উচ্চমাধ্যমিক গ) স্নাতক ঘ) স্নাতকোত্তর ঙ) উচ্চতর চ) অন্যান্য

৯। আপনার পরিবারের ধরন ?

ক) ছোট পরিবার খ) বৌখ পরিবার গ) অন্যান্য

১০। আপনি কার সাথে থাকেন?

ক) মা-বাবা খ) আত্মীয় গ) হোস্টেল ঘ) বন্ধুবান্ধব ঙ) একা চ) অন্যান্য

#### তৃতীয় অংশ

ধাপে ধাপে দয়া করে টিক চিহ্ন (✓) দিবেন। আপনি সঠিক উত্তর হিসেবে কেবল মাত্র একটি উত্তরই নিতে পারবেন।

১১। আপনার উচ্চতা? \_\_\_\_\_

১২। আপনার ওজন? \_\_\_\_\_

১৩। আপনি দিনে কয়বার শারীরিক ব্যায়াম করেন?

ক) ১-২ বার খ) ২-৩ বার গ) অন্যান্য ঘ) কোনটাই না

১৪। আপনি কোন ধরনের ব্যায়াম বেশি পছন্দ করেন?

ক) খেলাধুলা খ) হাঁটা গ) যোগ ব্যায়াম ঘ) কোনটাই না ঙ) অন্যান্য

১৫। আপনি দৈনিক কত সময় মোবাইল অথবা ল্যাপটপ ব্যবহারের পিছনে ব্যয় করেন?

ক) < দৈনিক এক ঘণ্টা খ) দৈনিক এক ঘণ্টা গ) দৈনিক দুই-তিন ঘণ্টা

ঘ) দৈনিক তিন-চার ঘণ্টা ঙ) দৈনিক >৪ ঘণ্টা চ) অন্যান্য

১৬। আপনার কি কোন পূর্ব মেডিকেল তথ্য রয়েছে ?

ক) উচ্চরক্তচাপ খ) নিম্নরক্তচাপ গ) মূলত ঘ) অপুষ্টি

ঙ) ডায়াবেটিস চ) যন্ত্রপালায়ক অথবা অনিয়মিত খুসুরান হ) অন্যান্য

#### চতুর্থ অংশ

১৭। আপনি কি জ্বাংক ফুড খান? (চাট দেখুন) ক) হ্যাঁ খ) না

যদি হ্যাঁ হয়, বাকি তথ্যগুলো পূরণ করুন।



১৮। আপনি কোন ধরনের জাংক ফুড বেশি খান? (চাট দেখুন)

- ক) নিমকি জাতিও খাবার                      খ) মিষ্টি জাতিও খাবার                      গ) মিষ্টি পানীয়  
ঘ) ফাস্ট ফুড                      ঙ) সব                      চ) অন্যান্য

১৯। আপনি কয়বার জাংক ফুড গ্রহণ করেন?

- ক) এক সপ্তাহে ৪ দিনের বেশি                      খ) এক সপ্তাহে ২-৪ দিন                      গ) এক সপ্তাহে ২ দিনের কম                      ঘ) অন্যান্য

২০। আপনি কখন সবচেয়ে বেশি জাংক ফুড গ্রহণ করেন?

- ক) শ্রমের সময়                      খ) বন্ধুদের সাথে                      গ) কোন অনুষ্ঠানে                      ঘ) একা থাকলে  
ঙ) অভিভাবকের সাথে                      চ) কোন নির্দিষ্ট সময়ে না                      ছ) পড়ালেখার সময়                      জ) অন্যান্য

২১। আপনি কোথায় জাংক ফুড বেশি গ্রহণ করেন?

- ক) ঘরে                      খ) শ্রমণে                      গ) দুলে                      ঘ) বন্ধুর বাসায়                      ঙ) রেস্টুরাতে                      চ) ফুটপাথের দোকানে                      চ) অন্যান্য

২২। আপনি কোথা থেকে জাংক ফুড কিনেন?

- ক) টেক-ওয়ে (Take-way) সার্ভিসের মাধ্যমে                      খ) ফুড অ্যাপ (Food app) এর মাধ্যমে  
গ) রেস্টুরা বা হোটেলে বসে খাওয়ার মাধ্যমে                      ঘ) অন্যান্য

২৩। আপনার স্কুল বা কলেজের আশেপাশে কতগুলো খাবারের দোকান রয়েছে যেখানে জাংক ফুড পাওয়া যায়? (চাট দেখুন)

- ক) <৫                      খ) ৫-১০                      গ) >১০                      ঘ) অন্যান্য

২৪। আপনি কি জানেন যে জাংক ফুড সাস্ট্রের জন্য খারাপ?

- ক) হ্যাঁ                      খ) না

২৫। আপনি দিনে কয়বার সুবন খাদ্য গ্রহণ করেন? (চাট দেখুন)

- ক) ১-২ বা                      খ) ২-৩ বার                      গ) ৪-৫ বার                      ঘ) অন্যান্য

২৬। জাংক ফুড খাওয়ার জন্য আপনি সাপ্তাহিক কত টাকা খরচ করেন?

- ক) <৫০ টাকা                      খ) ৫০-১০০ টাকা                      গ) >১০০ টাকা                      ঘ) অন্যান্য



## সুখম খাদ্য

কার্বোহাইড্রেট, চর্বি, ভিটামিন, খনিজ, প্রোটিন এবং ফাইবার সঠিক পরিমাণে ভরা খাবার।

## জার্ক ফুড

জার্ক ফুডকে এমন একটি খাবার হিসাবে সংজ্ঞায়িত করা হয় যাতে খুব কম পুষ্টি এবং প্রচুর চর্বি, চিনি এবং লবণ থাকে। আলুর চিপস, ক্যান্ডি এবং কোমল পানীয় ইত্যাদি প্রায়ই জার্ক ফুড হিসেবে বিবেচিত হয়।

## জার্ক ফুড চার্ট

নোনত খাবার	মিষ্টি	মিষ্টি পানীয়	ফাস্ট ফুড
চিপস, নাচোস, নির্মক, ফ্রেন্চ ব্রাই, পট্টো ওয়েজেস, পট্টো জ্যানকারস, ডাল ভাজা, লবণযুক্ত বাদাম ভাজা, চানাচুর, আল মুড়ি, লবণযুক্ত বিস্কুট, লবণযুক্ত পপকর্ন ইত্যাদি।	কেক, পেস্ট্রি, ডোনট, মিষ্টি (যেমন চনচন, সাদা মিষ্টি, লাল মিষ্টি, ইত্যাদি) ব্রাউনি, আপেল পাই, কাপ কেক, বাটার বান, মিষ্টি বান, খবুজ, বাকরখানি, জিম বান, চকোলেট, ওয়েফার, ওয়াকফেস, মিষ্টি বিস্কুট, কুকিজ, জোয়েল্যান্ট, মিষ্টি পপকর্ন, মাকিন কেক, শুকনো কেক, চুইংগাম, ইত্যাদি।	জুস, কোমল পানীয় যেমন পেপসি, নাউটেন ডিউ, কোকা-কোলা, ম্যাককোলা, স্প্রাইট, 7UP, আইসক্রিম, কফি, চা, এনার্জি ড্রিংকস, নিক শেক, স্ট্রবেরি শেক, ম্যাসো শেক, চকোলেট শেক, সোডা, সোননেড, নোজিটো, ইত্যাদি।	শিঙ্গাড়া, সানোসা, পিংজা, বাগার, চটপট, ফুচকা, পান্তা, নুভাস, বিরিয়ানি, চিকেন ব্রাই, চিকেন চ্যাপ, চিকেন টিক্স, চিকেন রোল, স্প্রিং রোল, ওন্টন, চিকেন নাগেটস, বিফ টিক্স, ডাল পুরি, আলু পুরি, কিনা পুরি, স্যাডউইচ, বেকন চিজবার্গার, চিকেন পরাটা, পরাটা, পানি পুরি, মুগলাই পরাটা, চিকেন বান, চিকেন প্যাটস, ভেলপুরি, পুরি, মুড়ি ইত্যাদি।

## Photo Gallery



**Figure 2 Data collection from middle adolescents**



**Figure 3 Data Collection from Late Adolescents**

SAMPLE NO. ১৫৪

Survey on Effect of Junk Food Consumption on the Nutritional Status of Adolescents.

This questionnaire is prepared to gather feedback on junk food consumption from adolescents aged 14-19 years. It will help to measure the tendency of eating junk food and the nutritional status of adolescents. The questionnaire is pretested. Your information will be kept confidential and only be used for research purpose.

Do you willing want to participate in this survey? Yes No

If yes, please fill out the questionnaire.

Section 1 (General Information)

Name: Juban Jaina Jubin

Address: (optional)

Contact No: (optional)

Please give tick (✓) marks where necessary. You have to choose only one answer where necessary.

- 1. What is your gender? Male Female
2. What's your age? <14 14-16 years 17-19 years
3. Your education level? Secondary Higher Secondary
4. Your marital status? Married Unmarried Others

Section 2 (Demographic Information)

Please give tick (✓) marks where necessary. You have to choose only one answer where necessary.

- 5. What is your mother's occupation? Housewife Service holder Others
6. What is your mother's education level? Secondary Higher Secondary Graduate Post Graduate Upper Others

নম্বা নং. ১৬

Effect of Junk Food Consumption on the Nutritional Status of Adolescents.

(কিশোর-কিশোরীদের পুষ্টিহ্রিত উপর অপুষ্টির খাবার গ্রহণের প্রভাব ১)

এই প্রশ্নপত্রটি ১৪-১৯ বছরের কিশোর-কিশোরীদের থেকে অপুষ্টির খাবার গ্রহণ সম্পর্কে প্রতিষ্ঠিত জ্ঞানের জন্য তৈরি হয়েছে। এই প্রশ্নপত্রটি কিশোর-কিশোরীদের অপুষ্টির খাবার গ্রহণের প্রবণতা ও পুষ্টিহ্রিত পরিমাণ করতে সহায়তা করবে। এই প্রশ্নপত্রটি সম্পূর্ণ পূর্ণ পরিকল্পিত। এই প্রশ্নপত্রটিতে কেবলমাত্র সঠিক তথ্য সম্পূর্ণ সঠিকভাবে দিতে হবে এবং শুধুমাত্র প্রকৃত কালে ব্যবহার করা হবে।

আপনি কি এই জরিপে অংশগ্রহণ করতে চান? হ্যাঁ ন

যদি হ্যাঁ হলে, অনুগ্রহ করে প্রশ্নপত্রটি পূরণ কর.....

প্রথম নাম (শাসনন তথ্য)

নাম: Arijun Islam

ঠিকানা: (অপদ্রব্য)

মোবাইল নং: (অপদ্রব্য)

প্রাথমিক স্থানে দয়া করে টিক চিহ্ন (✓) দিন। আপনি সঠিক উত্তর হিসেবে কেবলমাত্র একটি উত্তরই নিতে পারবেন।

- ১) আপনার লিঙ্গ? পুরুষ মহিলা
২) আপনার বয়স? <14 14-16 বছর 17-19 বছর
৩) আপনার শিক্ষার স্তর? মধ্যমিক উচ্চ মধ্যমিক
৪) আপনি কি? বিবাহিত অবিবাহিত অন্যান্য
৫) আপনার মাতার পেশা? স্নাতক স্নাতকোত্তর উচ্চতর অন্যান্য
৬) আপনার মাতার শিক্ষার স্তর? মধ্যমিক উচ্চমধ্যমিক স্নাতক স্নাতকোত্তর উচ্চতর অন্যান্য

Figure 4 Questionnaire submitted by School Going Adolescents

নম্বা নং. ১৭

Effect of Junk Food Consumption on the Nutritional Status of Adolescents.

(কিশোর-কিশোরীদের পুষ্টিহ্রিত উপর অপুষ্টির খাবার গ্রহণের প্রভাব ১)

এই প্রশ্নপত্রটি ১৪-১৯ বছরের কিশোর-কিশোরীদের থেকে অপুষ্টির খাবার গ্রহণ সম্পর্কে প্রতিষ্ঠিত জ্ঞানের জন্য তৈরি হয়েছে। এই প্রশ্নপত্রটি কিশোর-কিশোরীদের অপুষ্টির খাবার গ্রহণের প্রবণতা ও পুষ্টিহ্রিত পরিমাণ করতে সহায়তা করবে। এই প্রশ্নপত্রটি সম্পূর্ণ পূর্ণ পরিকল্পিত। এই প্রশ্নপত্রটিতে কেবলমাত্র সঠিক তথ্য সম্পূর্ণ সঠিকভাবে দিতে হবে এবং শুধুমাত্র প্রকৃত কালে ব্যবহার করা হবে।

আপনি কি এই জরিপে অংশগ্রহণ করতে চান? হ্যাঁ ন

যদি হ্যাঁ হলে, অনুগ্রহ করে প্রশ্নপত্রটি পূরণ কর.....

প্রথম নাম (শাসনন তথ্য)

নাম: MD. TAHAMINUS ZAMAN

ঠিকানা: (অপদ্রব্য)

মোবাইল নং: (অপদ্রব্য)

প্রাথমিক স্থানে দয়া করে টিক চিহ্ন (✓) দিন। আপনি সঠিক উত্তর হিসেবে কেবলমাত্র একটি উত্তরই নিতে পারবেন।

- ১) আপনার লিঙ্গ? পুরুষ মহিলা
২) আপনার বয়স? <14 14-16 বছর 17-19 বছর
৩) আপনার শিক্ষার স্তর? মধ্যমিক উচ্চ মধ্যমিক
৪) আপনি কি? বিবাহিত অবিবাহিত অন্যান্য
৫) আপনার মাতার পেশা? স্নাতক স্নাতকোত্তর উচ্চতর অন্যান্য
৬) আপনার মাতার শিক্ষার স্তর? মধ্যমিক উচ্চমধ্যমিক স্নাতক স্নাতকোত্তর উচ্চতর অন্যান্য

নম্বা নং. ১৮

Effect of Junk Food Consumption on the Nutritional Status of Adolescents.

(কিশোর-কিশোরীদের পুষ্টিহ্রিত উপর অপুষ্টির খাবার গ্রহণের প্রভাব ১)

এই প্রশ্নপত্রটি ১৪-১৯ বছরের কিশোর-কিশোরীদের থেকে অপুষ্টির খাবার গ্রহণ সম্পর্কে প্রতিষ্ঠিত জ্ঞানের জন্য তৈরি হয়েছে। এই প্রশ্নপত্রটি কিশোর-কিশোরীদের অপুষ্টির খাবার গ্রহণের প্রবণতা ও পুষ্টিহ্রিত পরিমাণ করতে সহায়তা করবে। এই প্রশ্নপত্রটি সম্পূর্ণ পূর্ণ পরিকল্পিত। এই প্রশ্নপত্রটিতে কেবলমাত্র সঠিক তথ্য সম্পূর্ণ সঠিকভাবে দিতে হবে এবং শুধুমাত্র প্রকৃত কালে ব্যবহার করা হবে।

আপনি কি এই জরিপে অংশগ্রহণ করতে চান? হ্যাঁ ন

যদি হ্যাঁ হলে, অনুগ্রহ করে প্রশ্নপত্রটি পূরণ কর.....

প্রথম নাম (শাসনন তথ্য)

নাম: মোঃ ইমরান

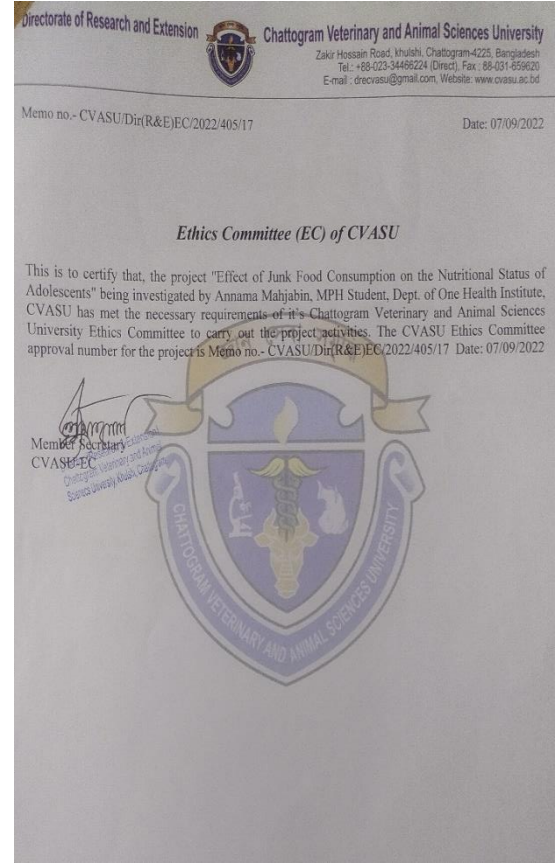
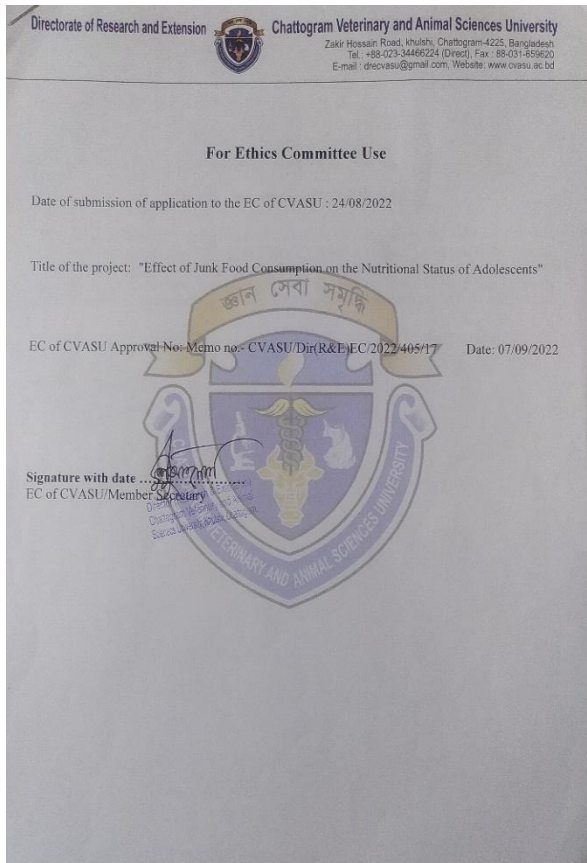
ঠিকানা: শাহজাহান সড়ক (অপদ্রব্য)

মোবাইল নং: (অপদ্রব্য)

প্রাথমিক স্থানে দয়া করে টিক চিহ্ন (✓) দিন। আপনি সঠিক উত্তর হিসেবে কেবলমাত্র একটি উত্তরই নিতে পারবেন।

- ১) আপনার লিঙ্গ? পুরুষ মহিলা
২) আপনার বয়স? <14 14-16 বছর 17-19 বছর
৩) আপনার শিক্ষার স্তর? মধ্যমিক উচ্চ মধ্যমিক
৪) আপনি কি? বিবাহিত অবিবাহিত অন্যান্য
৫) আপনার মাতার পেশা? স্নাতক স্নাতকোত্তর উচ্চতর অন্যান্য
৬) আপনার মাতার শিক্ষার স্তর? মধ্যমিক উচ্চমধ্যমিক স্নাতক স্নাতকোত্তর উচ্চতর অন্যান্য

Figure 5 Questionnaire Submitted by College Going Adolescents



**Figure 6 Ethical Review Committee Approval**



## **Brief biography of the student**



This is Annama Mahjabin, the daughter of Anjuman Ara and Md. Gulzar Hossain. She accomplished the Higher Secondary Certificate Exam in 2014 after passing the Secondary School Certificate Exam in 2012. She graduated from Chattagram Veterinary and Animal Sciences University (CVASU), Bangladesh, in 2019 (performed in 2020), obtaining a degree in food science and technology. She is currently a candidate for an MS in Public Health at Chattagram Veterinary and Animal Sciences University's One Health Institute. She finds out area of interest in working in health and nutrition-related research and development sector. She believes that it will help her to develop her career. She wants to work in a challenging environment where her ability to solve problems may be effectively utilized.