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Impact of Canteen Food on Brain Development of the Students: An Empirical Study on the University of Chittagong

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Abstract
The campus environment of the University plays an important role in the daily academic activities of students. Most students consume at least one snack or one meal in the canteens on most days of the week. The main objective of this paper is to explore the standard of canteen food on academic achievement through brain development of a public university in Bangladesh. Chittagong University was purposively selected as a study area for the present study. Adopting a descriptive qualitative approach and using the data of 2018, forty-one departments from eight faculties, this study finally juxtapose the four key issues like good hydration, food insufficiency, unhygienic foods, and diseases that lead straightly negative brain development of the students highly and so poor academic achievement of the University of Chittagong. Therefore this report suggests for providing green or fresh canteen food with fruits and vegetables, special combo meals in a week, food carnival and obligatory linked with food and nutrition departments. Finally, this paper recommended a complaint box in each faculty canteen to have regular feedback about canteen items and further improvement.

Keywords: green canteen food, brain development, academic achievement, university students JELCode: I10

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1. Introduction

The canteen is a great place to promote an enjoyment of healthy eating. For students who use the canteen regularly, the food purchased makes a

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significant contribution to their total food intake and nutrition. For students who don't use the canteen regularly, the canteen still plays an important educational and modeling role for healthy eating habits.

Therefore the food prepared by the cafeteria must contain all the nutrients needed by a student (Brener et al., 2009). The canteen plays a role in reinforcing knowledge, skills, and behaviors about healthy eating and lifestyle. Hence satisfaction of employees and clients is an important element of success for any organization and any sector of the economy (Bay, An & Laguador, 2014).

On the development of students' long-term eating habits, food preferences and attitudes towards food at educational institutions canteen has a considerable influence. This pressure has a positive effect on the brain of the students through academic act like:

a. Education behavior-attendance, dropout rates, and behavioral problems.

b. Students' concentration, memory, and mood in-class time.

c. Grades, exams, and graduation rates.

Food preferences are developed in childhood. However, having good eating habits and a balanced diet supports children's health and wellbeing, and minimizes the risk of illness with a lifelong influence[3].

Globally, the numbers of students enrolled in university or college education are high and increasing. Accordingly, the recent literacy rate for men and women aged between 15 to 24 years in Bangladesh increased to 92.24% in 2016, up from 61.87% in 2007[4]. The future success of university graduates, in terms of career, income, and associated health and quality of life, is significantly influenced by academic achievement while at university. As such, it is in the interest of both individuals and universities to determine the factors linked with canteen food and brain development for higher academic achievement.

2. Background and Objectives

In terms of area and students, the University of Chittagong is one of the largest public universities in Bangladesh. The point is, most of the students who study in such a public university are from the middle class and below

[3] Australian Government, The Department of Health report, 2009; health.gov.au

[4] . https://www.unesco.org/bangladesh-literacy-rate

middle-class earner families. They are heavily reliant on the university canteen for a reasonable price product. Not only that, as the hall of residence is not capable of providing early breakfast for morning class and lunch for non-resident students, a large portion has to take canteen food before completing their daily busy study and returning to the city. They have to comprise the quality of these foods whether they are sick or not however reduces significantly their brain development.

The objectives of the present study were to investigate the current status of available canteen facilities to explore the use of canteen in academic activities and to ascertain the necessary measures for improving the present situation of the canteen for different faculties of the University of Chittagong, Bangladesh.

2.1 Literature Review:

A considerable literature exists in the analysis of the impact of canteen food on the brain development of the students in different faculties.

In 1992 S. McBride claimed that dietary behavior in the Australian school was an important influence that might affect students' attitudes toward good nutrition and thus warn for careful consideration by authorities. Kanarek (1997) suggested that the food products sold in the canteen could directly influence weight outcomes as well as the impact on school performances for students' energy levels and ability to concentrate.

Trockel et al., (2000) also found a significant correlation between eating breakfast and GPA for first-year college students. Besides, Phillips G. W., (2005) in their article on Self-report of breakfast consumption on a biology exam reported a "significant difference" in exam achievement between those who did and did not consume breakfast. Bell and Swinburne (2005) found that the condition of unhealthy foods in the canteen leaded student to believe appropriate for daily consumption.

Markieeeu in 2013 viewed that a canteen was an establishment for supplying meals to customers in return for money. The customer would like to taste food considering the condition of the serving and cooking places and the quantity of the food they were served. In 2013 Munmun and Shatabdi claimed that private universities' food outlets should be cheered to offer a great range of healthy and subsidized food for the students.

R. S. Cartagena (2014) found that most foods and drinks of the three (3) school canteens were unhealthy with one canteen supplies nearly all unhealthy items. So most students across all levels take unhealthy foods

and drinks from these canteens and suffered from illness. D. J. R. Labayet. al. (2015) emphasized attending seminars related to food services to have more knowledge on improving their services for the canteen personnel.

However, there were no studies of a public university that assessed the canteen diet about brain development which leads to more academic achievement in university students. Given the increasing interest in the topic area, as well as in eating behaviors and the brain of university students more broadly, this is an important area for further investigation.

3. What is Brain Development?

Human brain development is a miraculous thing. It's speedy in the early stages of life. It slows down but never truly stops. In the past, many experts believed that the brain may have been done developing until at least age 20. However, most experts suggest that the brain is fully developed by age 25. The varsity students start their education at age 20. For some people, brain development may be complete before age 25; while for others, it may end after age 25. The mid-20s or "25" is just an average age given as a checkpoint for when the brain has likely become mature. Brain development has started during youth and changed occurring between ages 18 and 29 in a continuous process (Tanner-2009).

3.1 How does the brain change during development?

From early stages of adolescence into adulthood-developmental stages, the brain experiences major growth and smartness. For example during developmental stages,

- **a.** The nerves of the brain promote healthy brain functioning and allow for more complex functions.
- **b.** The connections between brain regions appear to be strengthened and the brain can transmit greater amounts of information for problem-solving.

3.2 Why do we need a Green (every day) Canteen?

The students deserve to eat good quality foods offered by the canteen. The varsity is responsible for the promotion of healthy dietary behaviors, and to make sure that students get adequate nutrients at least within the campus. The implementation of different canteen policies and regulations, like having different menus every day that will meet the standards of sufficient intake of nutritious foods.

3.3 Connection of Canteen Food with Brain Development

Active young people need good nutrition to support basic growth and development as well as additional nutrient-rich calories to fuel their activities. Children who are hungry are not able to focus and thus have a low attention span, behavioral issues, and discipline issues in school[5]. A recent study reports that children who skip breakfast have more difficulty focusing on classroom tasks and concentrating in class[6]. The following nutrients are necessary for everyday meals to have better brain nourishment:

Clever Carbohydrates

Carbohydrate is converted into blood glucose-the principal source of energy. Good sources of carbohydrates are flour, bread, milk, popcorn, potatoes, biscuits, etc.

The Power of Protein

A 4:1 carbohydrate to protein ratio is often cited as the ideal combination for sustaining energy and fuelling the muscles for growth, repair, and recovery in sports[7]. Good sources of protein are in chicken, fish, eggs, pulses, and nuts.

Smart Fats

People need fat to transport vitamins and proteins around the body to nerve function and manufacture important hormones. Established sources of fats are fish, nuts, and Yogurt.

Omega-3 Fatty Acids

Omega-3 fatty acids are essential for normal brain function. A diet rich in these acids like oily fish, nuts, and seeds can play a role in improving mood and brain development transmitting and receiving information otherwise in impaired learning and memory.

Healthy Hydration

Good hydration improves concentration and attention. Recent studies have shown that at about 1% dehydration (the equivalent of 1% of body weight water loss) there are negative effects on mental and physical function and these become more severe as dehydration gets worse.

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3.5 Challenges of Canteen's Food

The canteen's food usually faces the following challenges:

a. Allergy is the most common side effect of oily foods.

b. There are foods to blame for 90% of allergic reactions: milk, eggs, fish, and wheat.

c. Junk foods contribute to a yeast infection by sugar, starches, vinegar, and refined carbohydrates.

d. Heartburn can be caused for citrus fruits, fried and fatty foods, and chocolates.

e. Heart disease is the number one disease that is correlated with fatty and bad meat.

f. Blood cholesterol level can be increased if one consumes cholesterol-rich foods like beef, lamb, eggs, and liver, etc.

g. Excess consumption of oily foods creates high blood pressure, stroke, heart attack, memory and cognition impairment, migraine and other types of headaches, etc. Sometimes oily foods also cause kidney stones.

h. On the other hand, eating fast food could lead to brain damage. A steady diet of fast food can rob one's brain of certain nutrients it needs to function properly.

If a properly balanced meal is well cooked and well served under attractive conditions and with a happy discipline, its nutritional value is enhanced, and its educational value is incalculable. (Scottish E. (2002)[8]).

4. Methodology

This study was adopted a cluster sampling approach to divide entire students into smaller groups known as clusters (faculty). The randomly select sample among these clusters is used to analyze the influence of canteen food on academic reaching through brain development. This is a type of probability sampling. Provides every student in the varsity an equal and known chance of being selected in the sample group. The sample was collected in different time periods of the year 2018.

[8] . Hungry for Success (2002), Scotland's key policy document relating to school meals.

4.1 Study Area

The University of Chittagong, at present, has 08 faculties which consist of 43 departments and 07 institutes. Around 24,000 students are schooling from this varsity. There are 7 male residences (hall) and 04 female residences within the campus. Moreover, a lot of local cottages, cottages, and small houses are also used for living. Therefore these students badly depend on their meal system in different hotels restaurants, Bhat-Ghor, and canteens. However, most students prefer canteens of different faculties to provide cheap and qualitative food compared to others.

4.3 Sample Size: Sample size is estimated by the Cochran formula. According to the

Cochran formula for a large sample size, 385 or more measurements or surveys are needed to have a confidence level of 95% that the real value is within ± 5% of the surveyed value. The Cochran formula is as follows:

$$n_0 = \frac{Z^2 pq}{e^2}$$

$$n_0 = \frac{(1.96)^2 (0.5 * 0.5)}{(0.5)^2}$$

$$= 385$$

where n_0 = Raw Sample Size;

Z= Z is the abscissa of the normal curve that cuts off an area α at the tails (1 - α equals the desired confidence level. From the Z- distribution table at the confidence level of 95%, the value is 1.96

p= Variability in the large sample which is assumed at maximum 50%;

q= Remaining Variability in the large sample which is assumed at maximum 50%;

e = The level of precision ± 0.5, that means, the error margin.

The primary data had been collected using a comprehensive questionnaire with having 22 questions. The questionnaires were duly signed with the name of the department their ID, and the respective student's assigned dormitory (hall) name. In the primary data section, information collected from the students of the departments was considered the overall performance of canteen then the secondary data has verified the impact of the canteen on their brain development. In the university, there are 53 departments and institutes and our study areas had focused on the following 42 departments and institutes with a sample size of 415 students:

Table-1: Demography of the Study Area

Existing		Collected	
Faculties	Department	Faculties	Department
Arts and Humanities	13	Arts and Humanities	10
Biological Science	09	Biological Science	09
Engineering	02	Engineering	02
Law	01	Law	01
Science	05	Science	03
Social Science	09	Social Science	09
Business Administration	06	Business Administration	06
Physical Education	01	Physical Education	-
Total	46	Total	40
Institutes	07	Institutes	02
Grand Total	53	Grand Total	42

Source: www.cu.ac.bd

The annual nutrition data of Bangladesh for the period 2001-2018 have been used in the research and collected from various sources as follows.

a. Websites of National Nutrition Services;
b. Websites of World Health Organization;
c. Websites of UNESCO;
d. Ministry of Health and Family Affairs(MoHFW), Govt. of the peoples' Republic of Bangladesh;
e. Websites of US Aid;
f. Various articles published on related issues.

In the primary data section, by using descriptive qualitative method, information collected from the students of faculties and institutes is considered the overall impact of canteens food on the performance of brain for academic success and then the secondary data has verified the necessity of focusing the nutrition fact in the varsity of Bangladesh.

5. Layout of the Data Collection:

A. Percentage of Students using Canteen (Average)

One of the important is the time range of using canteens by the students. The collected data reveals that most of the students, on average 78%, are starting canteens use from morning especially 7.30-9.30 AM.

Table-1: Percentage of using canteens

Category	7.30-9.30 AM	9.30- 11.30 AM
Using Rate	78%	22%

In reality, most of the students have no other alternative sources rather than the canteen. The table represents that a significant amount- 67% of the collected data expressed having no other ways of having food. However, 32% showed having other sources.

Table- 2: Percentage of having an alternative source

Category	% of Alternative source
A. No other sources	67%
B. Partial sources	05%
C. Other sources	32%

The quality of food is not significant in the campus canteens. The students respond only around 23% to quality food. However, the data reveals that most of the foods are oily with fatty- 37% or oily with spicy- 33%. To have a higher positive impact on the brain the items of food are important. The table presents the scenery of these food items which have been scheduled by different menus. Most of the students in different faculties continue their daily starting menus with

Table- 3: Percentage of Food Standard in Canteens

Quality of Food	% of Use
Non-Standard	77%
A. Oily with Fat	37%
B.Oily with Spicy	33%
C. Oily, Fatty & Spicy	07%
Standard	23%

Table-4: Percentage of having different food items

Food Items	% of Use
Take Breakfast/Snacks	93%
A. Khichri with egg & Tea	23%
B. Paratha with pulse or vegetables & Tea	29%
C. Loaf or Cake or Shingara or Samosa or Biscuits with Banana & Tea	41%
No Breakfast/ Snacks	07%

low-grade Loaf Cake or Shingara or Samosa or Biscuits with Banana & Tea with a rate of 41%. Besides they take Khichri with egg & Tea by 23%. The percentage of taking Paratha with pulse or vegetables & Tea is 29%. However, 7 % of the students do not take anything from the campus canteen.

There are several dissatisfaction areas within the campus canteen food.

Table- 5: Percentage of Dissatisfaction in different categories

Category	% of Satisfaction	% of Dis-satisfaction
A. Hand Washing Materials	17%	83%
B. Air circulation	40%	60%
C. Hygienic	28%	72%
D. Food Sufficiency	11%	89%

The percentage of discontent for hygienic meals, the flow of air circulation, and hand washing materials at the time of taking food respectively are 72%, 60%, and 83%.

Students suffer from different types of sicknesses or diseases after having meals from canteens. The most important suffering is gastric pain with 71%. An additional illness-gastric with abdominal pain is 12%. Sometimes there is dysentery or diarrhea with gastric (10%).

Table- 6: Percentage of suffering different sicknesses/diseases

Type of Diseases/Sickness	% of Suffering
Suffering	98%
A. Only Gastric	71%
B. Gastric with Abdominal Pain	12%
C. Gastric with Dysentery or Diarrhea	10%
D. Others	05%
NotSuffering	02%

B. Faculty wise Canteen

The canteens using rate is higher and similar for the students of biological science and BBA the case of PowerPoint education system varsities are in the top categories. On the other hand, 15% of all colleges and 29% of all schools are using 1-3 numbers of laptops in the class.

Figure-1: Faculty-wise Canteen Using Rate Status

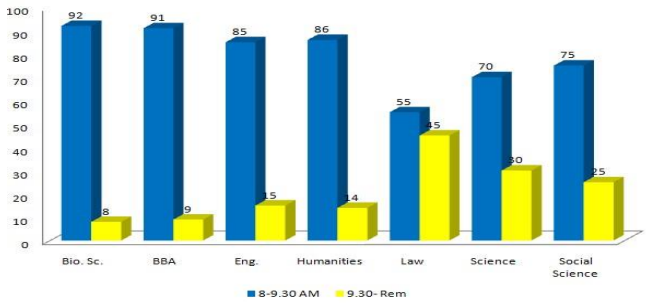
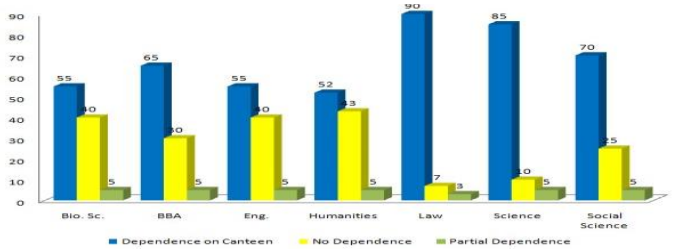
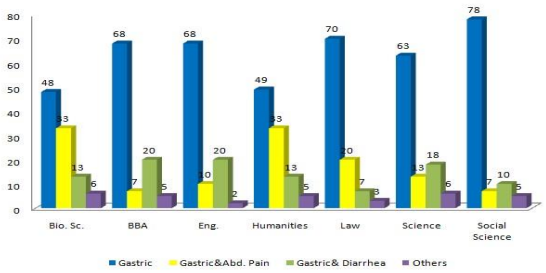


Figure-2: Faculty-wise Canteen Dependency



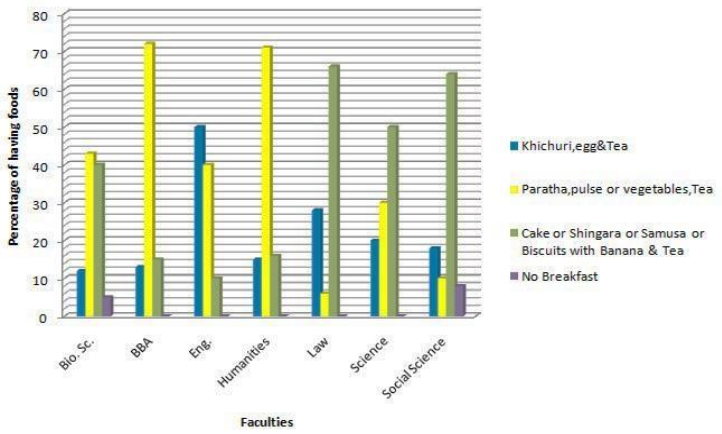
This bar diagram shows most of the students of different faculties have a higher dependency on canteens. The students of Law faculty depends 90% on canteen while students of Humanities have a low dependency of 52%. Moreover, Engineering and Biological faculty's students express similar dependency on canteen with a 55%. However, a higher non-dependency of 43% stays for Humanities Faculty.

Figure-3: Faculty wise suffering Diseases



The canteens food items cause different types of sickness. Gastric becomes the higher distress in almost all faculties. The percentage of having Gastric is higher for Social Science faculty (78%) but considerably lower percentage for Biological Faculty (48%). The students also suffer from abdominal pain with Gastric. This percentage for this type of illness is 33% for both Humanities and Biological Science Faculties. The sufferings into Diarrhea, Dysentery with Gastric are higher for BBA and Engineering faculty (20%).

Figure-4: Faculty-wise Food Items

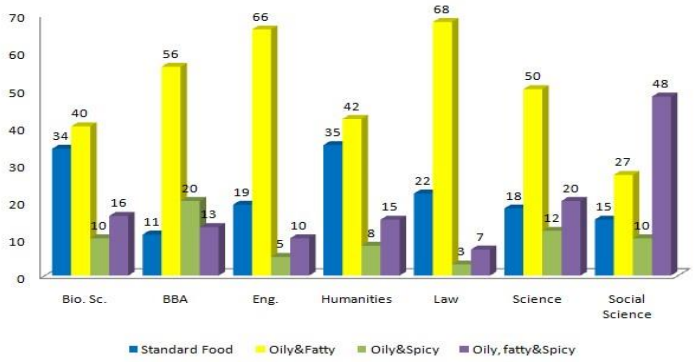


The students from three faculties- Biological Science, BBA, and Humanities, regularly take paratha, pulse, or vegetables with tea by a higher percentage (70%). Furthermore, the students from

another three faculties-Social Science, Law and Science commonly take cake or Shingara or Samosa or biscuits with banana and tea by approximately 60%. However, the students from the Engineering faculty receive Khichri, egg with tea by 50%.

This diagram-5 presents the standard of food according to faculty. The data reveals that 68% of students of Law Faculty face oily and fatty food. Likewise, only 11% of students of BBA Faculty face standard food. Similarly, 48% of students of Social Science Faculty face oily, fatty, and spicy food.

Figure-5: Faculty wise Food Standard



A higher percentage of dissatisfaction exists in different faculties for diverse categories. Around 95% of students of Law and BBA faculty expressed in figure-6 their unhappiness in hand washing supplies. Accordingly, the students of the Engineering Faculty express their highest dissatisfaction with insufficient food (95%). The students of Science Faculty confirm their highest dissatisfaction with unhygienic food (85%). Moreover, the circulation of air is highly insufficient for BBA faculty students.

Figure-6: Faculty wise Dissatisfied Canteen Status

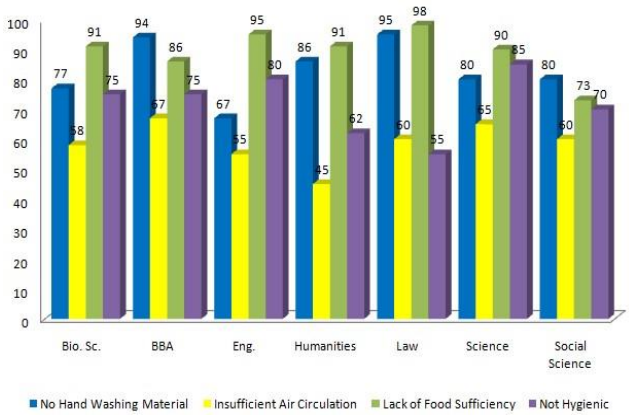
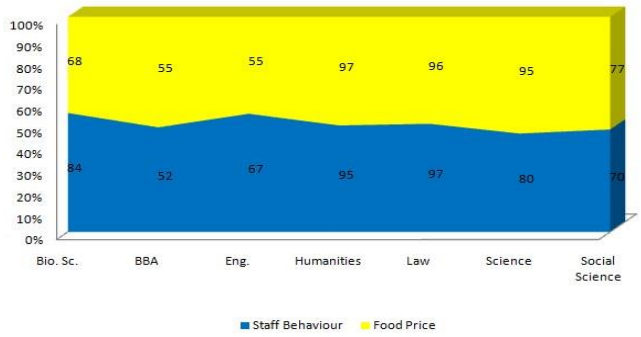


Figure-7: Faculty wise Content Canteen Performance



Several good symbols have been discovered in the case for canteen performance. From the collected data the students of Law faculty confirm 97% satisfaction on canteen's staff behavior to them wherever the students of BBA faculty confirms only 52% satisfaction level. On the other hand the students of both Humanities and Law faculty express similar satisfaction (97%) on the reasonable food price.

6. Result and Discussion

There are a total of seven canteens in eight faculties with a central canteen named CUCSU (Chittagong University Central Students Union) Canteen at the University of Chittagong. At present The Arts and Humanities faculty has no specific canteen however the construction of the new second building is continuing and it is hoped that students will use new canteen in this building soon.

The existing canteens of the university are a specious and well-lit area in most faculties. These canteens always try to provide value foods and services at a reasonable price to students, faculty (E.g. Engineering faculty), staff, and guests. The University's Canteens offer snacks and drinks as well as hot and cold meals for breakfast and lunch. All canteens are closed in the evening and at night specifically after 2 pm although most of the students (non-residents) do not leave varsity within this time. The brain of every student needs to function properly not only within the campus but forever. Like a motorcycle, the brain functions best when it gets only premium fuel (nutrient foods) however substandard other than premium fuel. Thus it's imperative to sense smartness and choose what's best for the brain.

The faculty's canteens start their daily inauguration breakfast, from 7 am to till 9.30 am and around 78% of the students arrive on campus within this time. 67% of the students mention having no other sources for breakfast other than the canteens. So to sustain normal growth and academic development dietary adequacy is of the ultimate importance for students with

their nutrient requirements. Even mild nutrient deficiencies can end with negative long-term effects on growth and function (Sampson et al., 1995).

Diets that are high in refined sugars, oily, fatty, and spicy for example, are harmful to the brain. Food is like a pharmaceutical compound that affects the brain. The university students (77%) face non-standard food like oily, fatty, spicy, and unhygienic. The students from Law Faculty face the highest 68% amount of oily and fatty food and the students from Social Science Faculty face the highest 48% amount of oily fatty and spicy food in their respective canteen. Diet, exercise, and sleep have the potential to alter brain health and mental function. (Professor Fernando Gómez-Pinilla, UCLA).

The students who arrive on the campus always have a breakfast menu of either Khichri with egg& Tea or Paratha with pulse & Tea or Paratha with vegetables & Tea; or Cake with Banana &Tea (the time range 7.30 – 9.30 am); or Shingara& Tea; or Samosa & Tea or Biscuits with Banana & Tea. However, the problem with Paratha is of totally oily with low-grade flour to make it cheaper and most of them are using palm oil. Biscuit, egg and

Khichri is good for the menus but the ingredients of Khichri - especially yellow for Tamarind flavour, is full of low-quality rice, palm oil, and spices. The percentage of taking vegetables in their meals is very poor also, 29% of the students. Nutrition affects the learning and behavior of the students who had inadequate fruit and vegetable intake (Lahey& Rosen, 2010).

Keeping hands clean is one of the most important steps and many diseases are spread by not washing hands with soap and clean water- from the common cold to more serious infections, such as the flu, and most types of infectious diarrhea. In fact, washing hands with soap can reduce the risk of diarrhea by up to 47% (V. Curtis: 2003). 83% of the students are entirely dissatisfied with the hand washing contents in their campus canteens and they requested to provide them on an urgent basis. Not only does this put a financial strain on families but also impacts the educational development of students. A handwashing gel is recommended form of hand antisepsis and staff (hospital) take every precaution to reduce the spread of infection (Macdonald, 2006).

Ventilation influences air quality and energy efficiency, and proper ventilation controls odors, dilutes gases (such as carbon dioxide), and inhibits the spread of respiratory diseases. The flow of air circulation in the canteens of different faculties is below average as the level of dissatisfaction is near 60%. Moreover, the students of Science and BBA

Faculties express their higher discontent in this case. There are some recent studies reporting the associations between the provision of ventilation (outdoor air) and students' health and academic performance. A study from the Southwestern United States estimated that For every l/s per person increase up to 7.1 l/s per person, the percentage of students passing the State's core curriculum-based standardized tests could increase by 2.9% in mathematics and 2.7% in reading (D, Shaughnessy -2011).

The sufficiency of food becomes an immense dissatisfaction by almost all faculties at a rate higher than 90%. The students from faculty of Law, Engineering, BBA, Biological Science, and science have a discontent of 98%, 95%, 94%, 90%, and 91% respectively. Thus the administrators should be concerned with the taste and smell of food, brands offered friendliness of staff, and time is given to eat once students have been served their food. (Kublik et al.,-2003). Students who can start the day on task because they are not distracted by an empty stomach are more ready to learn. (Wendy Bolger, director, No Kid Hungry).

A great symbol of awareness in the case for hygienic has been found in the students Chittagong University. However, 28% are only satisfied with the hygienic supplied foods. Good nutrition + exercise = optimal learning and proper nutritional support are important to allow the brain to function at its highest ability and to enhance learning (Wolfe and Burkman-2000). Hygienic foods provide balanced nutrition that helps students reach their potential.

Good hydration is a key to a person who wants to perform to the better of their ability, both mentally and physically. A simple loss of just 1% of body weight can start to decrease performance. Dehydration can lead to fatigue, dizziness, impaired concentration, and reduced cognitive abilities. The student's response to the pure drinking water is not also satisfactory. Nowadays the people of Bangladesh are facing several water-related diseases like arsenic, diarrhea, skin and eye infections. They are spread by contaminated water and by eating insufficiently cooked fish. The students also expressed to drink purifying water rather than only deep tube well or supply water. Drinking water improves academic achievements in schools (C. M. Wadan-2012). The students are suffering from various illnesses like gastric, abdominal pain, dysentery, diarrhea, and headache, etc. Although gastric is in high percentage among all faculties around 68% however the minimum percentage of suffering diarrhea, abdominal pain is 10% and 7%

respectively. These lead to several missing classes that affect academic performance through brain distressing.

Student satisfaction only exists in the case of food prices and the behaviour of staff. These lead to having a positive impact on their brain that they have to pay lower and be well behaved by them. However, the students from BBA faculty express their high dissatisfaction of 55% and 52% respectively in both cases.

Actually, it's hard to focus in study when one is hungry. So the association between insufficient dietary intake and brain development for academic achievement of university students is vital. The different categories of sicknesses especially diarrhea and dysentery are directly related to malnutrition. Worm infestation, diarrhea, malaria, and dysentery are important causes of anemia. Proper hand-washing materials, pure drinking water, and green (fresh) food could get rid of anemia. The dietary data shows fewer amounts of fruits, vegetables, and a high amount of junk food, etc. However regular breakfast consumption, higher consumption of fruit, vegetables, and certain micronutrients, including folate and iron, and lower consumption of junk foods, were all associated with higher academic achievement (Burrows et al.-2017). On the other hand, the brain requires significant and regular amounts of energy to function optimally. The associations between higher consumption of nutrient-rich foods, such as fruits and vegetables, and lower consumption of nutrient-poor foods, such as junk foods, oily foods, fatty and spicy foods could then be explained by higher intakes of essential micronutrients. In addition, the associations of consuming breakfast and regular meals with higher academic achievement could be that more frequent and regular eating occasions provide a vehicle for the delivery of these nutrients, as well as adequate energy to fuel brain function.

7. Recommendations

Canteen vendors are expected to follow food service guidelines by NNS. These healthy set meals incorporate food from the four main food groups – brown rice and whole meal bread, meat and others, vegetables and fruit – thereby helping students receive the right nutrients necessary for their growing needs. Moreover, the following ideas are recommended:

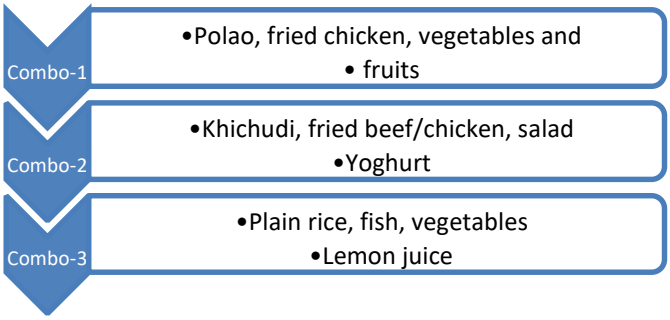
a. Every canteen under each faculty should have been supervised by a faculty committee with having senior teachers as a Head and some other students from the different departments for a fiscal year.

b. Pre-paid Canteen Card for each enrolled student.
c. Display colorful names for each item like 'Mouth-watering Khichri melts with pickle' for every day (GREEN) snacks.
d. Setting different sections to avoid turmoil circumstances like

First Year-Third Year & Junior Visitors: Section-A

Fourth Years-Master & Senior Visitors: Section-B

e. All food must be served in a tray with having ordered a meal.
f. Canteen Facebook page for daily and special menus.
g. Food carnival among canteen wise.
h. Organizing culinary training for the canteen vendors.
i. Some common selections include fried rice, noodles (not instant) and salad etc.
j. Reduce the amount of sugar, butter, and salt added extra to make foods attractive.
k. Canteens must form a link with food and nutrition departments.
l. A suggestion box by the counter is a great way for students to give feedback about canteen items and identify new foods or drinks they would like to see on the menu.
m. Moreover, we suggest the following special combinations of meals every in week: Figure-10: Different Combination of Proposed Meals



8. Conclusion

Well-planned canteens support student development and learning. Besides sustainable brain development, a food-based dietary approach to increase consumption of micronutrient food-Vitamin-A, Iron, and Folate, is important. The objectives of this study are fulfilled as the current performances of the faculty's canteen food are not good enough with

having a clear connection of canteen food to brain development. Using the cross-section data of the year 2018, this report suggests some policy implications like sufficient food in canteens up to the last class or practice session, purified water for at least drinking, low oily, fatty, and spicy food for reducing sickness and maintaining NNS provided hygienic food for university students. The 'university effect'- an increase in the supply of skilled graduates, raises productivity in the firms and the economy. We believe canteen plays an important role in the daily life of students and to create this 'university effect'.

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