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Feeding Habits and its Impact on Concentration and Attentiveness among Medical Students in Dominica

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Abstract

Title: Feeding habits and its impact on concentration and attentiveness among medical students in Dominica.

Background: Food is essential for good health. Aside other benefits, it has been acknowledged that the status of the learning process is directly proportional to good nutrition. However, studies have shown that majority of medical student do not participate in a healthy dietary plan, because of time and workload. As a result, it is suspected that some medical students may have a poor learning process. This study thus tries to correlate food and academic performance among medical students in Dominica.

Methods and Findings: A total of 182 students participated. Self-administered questionnaires were distributed and analysis done by Stata IC 13. Amongst the group studied, 169 (92.35%) acknowledged to skipping meals, while 111 (62.01%) preferred junk food to healthy diets while studying. Majority of students with poor intake of balanced diet could only spend 3-4 hrs studying. Also, students who had regular breakfast testified to be able to stay more than 6 hrs studying.

Conclusion: This study supported the fact that food plays a vital role in the learning process of students. In addition to identifying the correlate, the study also recognized the need for proper student awareness on food choices.

Keywords Diet; Concentration; Attentiveness; Food

Introduction

The importance and benefits of food in the human body cannot be over-emphasized. The cells in human body obtain energy from food calories in the form of macronutrients derived from carbohydrates, proteins and fats [1]. The human body receives most of its energy from carbohydrate as it is easily broken down into simple sugars [2]. The brain needs at least 130 grams of carbohydrates (about 520 calories per day) to function adequately [1,2]. It is usually recommended that 45-65% of total daily calories should come from carbohydrates, 12-20% from proteins, and 20-35% from fats [1].

Food fortifies the body with energy, vitamins, and minerals which are involved in processes that promote neuronal survival [3], by synthesizing neurotransmitters responsible for the efficient flow of information across synapses [4]. Deficiencies or excesses of certain micronutrients can lead to nerves damage in the brain, resulting in changes in memory, impairing brain function and limiting ability to solve problems [5]. Vitamins and minerals are very essential in humans even though they are needed in small amounts [6]. They help in energy production, collagen synthesis, blood vessel walls support, vision, bone formation, and have antioxidant functions [7]. Minerals also play a role in maintaining water balance, protein structure stability, bone strength and immune responses [5].

As pertain to learning, healthy feeding habit plays a substantial role in improving students' cognition, concentration, and energy levels [8]. Poor nutrition can make students susceptible to illness, headaches, poor concentration, and associated disease, which results in school absence, thus leading to poor performance [7]. An example is breakfast which has been identified to have vital role in brain development of young adults, although, these age group are usually associated with the highest rate in skipping breakfast [9]. Most studies have evaluated the necessity of breakfast alone [9-11], thus, this study examines the complete feeding habit of medical student in Dominica. It also recognizes the link between feeding habit of students and concentration, as well as the level of attentiveness.

Materials and Method

A cross-sectional study design was conducted to measure the association between feeding habits, attentiveness, and concentration among young people (10-24 years, based on WHO standard [12]. The sample selection was based on laid down

facts that young adults are more linked with the onset of puberty and cognitive development and thus need more nutrients for proper development [11]. Also, they are also associated with frequent habit of skipping meals [13]. The study involved students of All Saints University, School Of Medicine, Commonwealth of Dominica. The research was carried out in the month of July, 2016. A total of 182 students participated voluntarily in the study with an average of twenty two students from each class. Permission was obtained from the school and signed consent was gotten from each participant involved in the study. Data collection was by a self-administered questionnaire to identify eating pattern and nature of food ingested. The questionnaire assessed the quality of food and study duration. Grouping of the results was made and analysis was done using Stata IC 13. Frequency distribution table to compare variables were used and statistical significance was kept constant at $P<0.05$.

Result

A total of 182 students participated in the study. 72 (39.56%) and 110 (60.44%) were male and female respectively. Baseline characteristics of feeding habit were analyzed (**Table 1**). In identifying how many students take balanced meals, 37 (20.44%) acknowledged poorly balanced meals, while 20 (11.05%) testified to having balanced meals on regular basis, 124 (68.51%) students were indifferent. 43 (23.76%) students admitted to never skipping meals. On the other hand, 34 (18.78%) acknowledged to frequent meal skipping while 104 (57.46%) students were on the average. 28 (15.38%), 114 (62.64%), 33 (18.13%), and 7 (3.85%) students signified in taking one-square, two-square, three-square and more than three-square meals daily, respectively. 111 (62.71%) students described their behavior in class after meals as being very attentive while 51 (28.81%) felt not attentive/drowsy and 15 (8.47%) acknowledged sleeping in class after meals.

Table 1 Distribution of students based on response to questionnaire.

Baseline questions	Yes (%)	No (%)
Do you have a regular feeding habit?	81 (44.51)	101 (55.49)
Do you eat breakfast everyday?	33 (18.03)	150 (81.97)
Do you eat lunch everyday?	116 (63.74)	66 (36.26)
Do you eat dinner everyday?	80 (44.20)	101 (55.80)
Do you skip meals?	169 (92.35)	14 (7.65)
Do you think what you eat has any role in your academic performance?	96 (54.24)	79 (44.63)
Do you prefer energy boosters (e.g. lucozade, boom, etc) to food while studying?	60 (33.15)	121 (66.85)
Do you prefer junks to food while studying?	111 (62.01)	68 (37.99)
Do you eat before exams?	82 (45.05)	99 (54.40)

Additional evaluation showed that 78 (42.86%), 99 (54.40%) and 5 (2.75%) students take coffee, do not take coffee and take decaffeinated coffee respectively. 8 (4.47%) acknowledged to be addicted to coffee. Among the students that consume coffee, 45 (52.33%) took coffee to stay awake, 5 (5.81%) took coffee to concentrate with studying, while 33 (38.37%) took coffee for the simple reason that they love taking coffee. 58 (32.40%) students stated that their performance in exams was better if they ate before the exam. However, 16 (8.94%) stated that their grades were worse if they ate before exams, 105 (58.66%) acknowledged no influence in grades irrespective of eating or not eating before the exam.

Further analysis to link various feeding habits to studying habits and performance was also done (**Table 2**). Majority of the students had a study schedule of 3-4 hrs daily, with incidence of 83 (45.86%), with only 27 (14.92%) spending more than 6 hrs every day. 65 (58.56%) students who paid attention in class after meals also acknowledged to studying better at night.

Table 2 Relationship between study habit and feeding routine.

Baseline characteristics	Study hrs (%)					Preferable time to study (%)		
	1-2 hrs	3-4 hrs	5-6 hrs	>6 hrs	p-value	During the day	At night	p-value
Students with poor intake of balanced diets	1 (7.69)	23 (62.16)	9 (15.79)	4 (15.38)	0.053	14 (38.89)	22 (61.11)	0.547
Students with average intake of balanced diets	8 (6.56)	55 (45.08)	42 (34.43)	17 (13.93)	0.053	57 (45.97)	67 (54.03)	0.547

Students with good intake of balanced diets	4 (20)	5 (25)	6 (30)	5 (25)	0.053	7 (35)	13 (65)	0.547
Students who take breakfast everyday	4 (12.12)	16 (48.48)	7 (21.21)	6 (18.18)	0.362	13 (39.39)	20 (60.61)	0.607
Students who take lunch everyday	7 (6.09)	53 (46.09)	37 (32.17)	18 (15.65)	0.886	56 (48.28)	68 (51.72)	0.093
Students who take dinner everyday	10 (12.50)	29 (36.25)	29 (36.25)	12 (15)	0.029	30 (37.97)	49 (62.03)	0.199
Students who skip meals often	1 (3.13)	16 (50)	10 (31.25)	5 (15.63)	0.486	17 (51.52)	16 (48.48)	0.620
Students who prefer energy boosters while studying	4 (6.67)	30 (50)	23 (38.33)	3(5)	0.053	19 (32.20)	40 (67.80)	0.035
Students who prefer junks while studying	8 (7.34)	51 (46.79)	32 (29.36)	18 (16.51)	0.843	49 (44.55)	61 (55.45)	0.659
Students who take coffee	6 (7.79)	27 (35.06)	26 (33.77)	18 (23.38)	0.53	32 (41.03)	46 (58.97)	0.690

Discussion

It is common logic that a healthy and balanced diet could lead to a better academic performance. Healthy eating would lead to a better immune system, which would mean less times falling sick and less absences from school [7]. In a study involving Danish children aged 8-11, it was found that serving healthy school meals improved their reading performance but had no effect on their concentration [14]. Breakfast is widely known to improve performance in school, sadly a small percentage of students (33%) actually take breakfast on a regular basis [15]. A study conducted in Korea confirmed that eating breakfast and consuming fruits and milk have a positive correlation with school performance [15]. Most students (62.71%) were attentive in class after a meal. This is perhaps due to the production of glucose in the body, which the brain utilizes. The others were either drowsy (28.81%) or sleeping (8.47%), due to a phenomenon commonly referred to as postprandial somnolence or post-lunch dip which affects our circadian rhythm [16]. This could perhaps be due to consumption of tryptophan containing foods or consumption of a large meal. Tryptophan is the precursor of melatonin which regulates sleep [16].

As coffee is widely consumed and known to be a stimulant especially among medical students, although, a smaller than expected number of students were found to take coffee 78 (42.86%). Of this 78 students, 50 of them took coffee to stay awake or to help concentrate during study. Coffee contains caffeine which acts as a stimulant which is helpful to keep awake, but may have other adverse effects such as addiction or discoloration of teeth with prolonged intake [8]. Most students who took coffee preferred night study (58.97%) and almost 25% were able to study for more than 6 hrs a day with only 7.79% studying for less than 3 hrs. Caffeine may have other beneficial effects such as acting as an antioxidant which is helpful for the brain [17]. Most students preferred to eat junk food while studying. Junks could be quick sources of glucose to the brain. Most students who preferred energy boosters acknowledged studying at night, because these boosters tend to increase alertness [16]. This data indicate a possible link between use of the stimulants (energy boosters, junks, and coffee) as an aid night study for more than 3 hrs. However, a study indicated and confirmed a negative correlation with academic performance and diet of fast foods, instant noodles, soft drinks, confections [15]. Another study conducted on Chilean students found that a low fiber, high fat, energy dense diet in adolescents was associated with reduced academic performance [18].

Although, this study didn't capture the actual performance of students based on exam or test results, the study was able to recognize the effect of feeding habits on student's attitude towards academics. For future studies, it may be more beneficial to get appropriate test or exam results of students to better assess the role of their diet in their academic performance. Certain foods are known to be cognitive enhancing rather than others. A diet of mixed grains was found to be beneficial in cognitive performance due to reducing mental fatigue rather than being cognition enhancers [19]. Other factors could also affect academic performance aside diet such as illness, sleep, exercise, and socioeconomic factors. These factors should also be taken into consideration in future research.

Recommendation and Conclusion

One of the major factors influencing poor feeding regimen is that most individuals do not consider choices of food as vital for optimal daily work output. This study confirms the fact that food choices influence the learning process. The preliminary study was able to link the effect of skipping meals on concentration and attentiveness. The study also pointed out the fact that medical students in Dominica may not have a proper feeding habit, thus affecting their learning process. Although the study did not capture meal content and academic performance, it was able to identify the need for proper awareness of students on how feeding affects academic performance. Medical colleges could also make healthy meal packs and food supplements available to students at affordable prices.

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