



The prevalence of breakfast skipping among medical students and its neuroglycopenic effects

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Citation this Article: Dr. Prannoy Paul, Dr. Arun N Bhatt, “The prevalence of breakfast skipping among medical students and its neuroglycopenic effects ”, ijmsir- January - 2020, Vol – 5, Issue -1, P. No. 149-156.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Objectives: To estimate the prevalence of breakfast skipping among medical students and its effect on neuroglycopenic symptoms they experience during their class hours.

Methods: A descriptive cross sectional study on breakfast eating habits and associated neuroglycopenic symptoms was conducted. Participants included medical students from each year, selected by stratified and systematic random sampling.

Sample size was 122. Self-administered questionnaire to assess the frequency of breakfast skipping and the neuroglycopenic symptoms they experienced during their class hours were distributed to the participants.

Study Setting: M.O.S.C Medical College, Kolenchery, Kerala, India.

Results : The prevalence of skipping breakfast more than 5 days in the past 2 weeks among the study population was 14.8% (95% CI = 8.5 – 21.1) and up to 4 days in the past 2 weeks was 40.16% (95% CI = 31.47-48.84). Habitual breakfast skippers had significantly higher neuroglycopenic effect scores

during class hours compared to non-skippers. (Mann Whitney U test; W= 611) (p= 0.019).

Conclusions: The prevalence of breakfast skipping among medical students is high. Habitual breakfast skippers experience more neuroglycopenic symptoms compared to non-skippers during their class hours.

Keywords: breakfast, students, medical

Introduction

Breakfast is considered to be the most important meal of a day. The macronutrient profile and the micronutrient intake are better in those who consume breakfast regularly compared to breakfast skippers. Breakfast is particularly important for students. Positron Emission Tomography studies show that the metabolic glucose demand of human brain is almost twice in the growing years when compared to adults [1]. The average cerebral oxygen utilization and cerebral blood flow in these age groups are also higher compared to adults [2]. Students also have higher sleep demands and hence suffer greater depletion of glycogen stores overnight [3]. Hence, a proper breakfast in the morning is vital to meet the metabolic and glycaemic needs of the brain.

Studies have found that students who consume breakfast regularly had more favorable intake of total carbohydrate, dietary fiber and lesser intake of total fat and cholesterol [4]. Breakfast also positively influences the total micronutrient intake in the daily diet, which is partly due to the fortification of breakfast cereals [5]. Regular breakfast consuming students have up to 20-60% higher levels of iron, B vitamins and Vitamin D compared to breakfast skippers [6]. Regular breakfast is also found to be helpful in maintaining weight and BMI in the normal range. Two systematic reviews have concluded that adolescents who took regular breakfast were less likely to be overweight [7,8]. Having a regular breakfast is also associated with healthier lifestyle factors. Children who regularly consumed breakfast were found to have a better cardio respiratory fitness level and were more physically active when compared to breakfast skippers [9]. There is also evidence proving the positive effect of breakfast on learning, improving the cognitive functions, behavior and overall academic performance in students [10]. Studies have found that in students, breakfast improves the academic performance, particularly in the domains of attention and memory [11, 12]. Undernourished children demonstrate a significant improvement in attention and memory functions when proper breakfast is added to their daily diet [13].

In spite of this, the prevalence of breakfast skipping is very high among students, making breakfast the most commonly skipped meal of the day among young students [4]. Breakfast skipping is also widely prevalent among medical students. In a study conducted in the University of Ghana medical school, the prevalence of habitual breakfast skipping among medical students was found to be 71.9 %.) Also, breakfast skippers reported higher levels of fatigue and poor attention

during their clinical sessions compared to non-skippers [14]. A similar study conducted in China, reported that the prevalence of breakfast skipping among medical students to be 41% [15]. Data from India on this topic are limited. A study conducted in a teaching hospital in India reported the prevalence of breakfast skipping among medical students to be as high as 45 % [16].

Health care professionals are considered to be the role models for healthy lifestyle to the general public. In view of this, the World Health Organization (WHO) in early 1999, stated that physicians being the role models for healthy lifestyle shouldn't overlook their own lifestyle habits [17]. It is in the medical schools that most of these students understand and develop healthy lifestyles and eating patterns which they usually follow even after their studies and while practicing as doctors and become promoters of healthy lifestyle and eating habits.

This study aims to find out the prevalence of breakfast skipping among medical students in a teaching hospital in southern India, and to compare the neuroglycopenic effects experienced by habitual breakfast skippers with that of non-skippers.

Methodology

Study Setting and participants: The study was conducted in a medical college situated in Kerala, India. Equal numbers of medical students were selected each from first to final academic year. The participants were selected by systematic random sampling from the attendance register. The sample size was 122, calculated for 45% expected prevalence of breakfast skipping, [16] α error of 5% and 20% relative precision. Participants who gave voluntary informed consent were recruited into the study. Participants were provided a self-administered questionnaire [fig. 1] to assess the frequency of breakfast skipping and the frequency of

neuroglycopenic symptoms that they experienced. Neuroglycopenic effects score was calculated based on 23 symptoms, each with a score of 1-5. The minimum total score being 23 and maximum being 115. The scale was peer reviewed and pilot tested. Internal consistency of the scale was found to be good (Cronbach Alpha with 23 items :0.854)

Ethical Aspects

The study was approved by the Institutional review board. Participants who gave voluntary informed consent were recruited into the study. All the data were kept confidential and private.

Results

A total of 122 medical students, were recruited into the study. Table 1 shows the major participant characteristics. 28% (n=34) of the students were males and 72% (n=88) were females. 13% (n=16) of the participants were day scholars whereas 87% (n=106) were hostellers. 31% (n=38) of the participants were undergoing non clinical rotations whereas 69% (n=84) were undergoing clinical rotations during the study period.

On calculating the prevalence of breakfast skipping, the point prevalence (skipped breakfast on the day of assessment) was 21.31%. (95% CI = 14.04 – 28.58) and the period prevalence (skipped breakfast at least once in the past 2 weeks) was 49.2% (95% CI =40.30 - 58.1). The prevalence of habitual skippers (skipped breakfast for more than or equal to 5 days in the past 2 weeks) was 14.8% (95% CI = 8.5 – 21.1) and that of occasional skippers (skipped breakfast up to 4 days in the past 2 weeks) was 40.16% (95% CI = 31.47-48.84). Each participant was asked the about 23 symptoms associated with low blood glucose levels such as inability to concentrate or feeling irritated, and to score them on a scale of 1 to 5 depending on its frequency in

the past 2 weeks. With regard to the neuroglycopenic effects score, (the minimum possible score being 23 and maximum being 115) the minimum score recorded was 25 and the maximum was 86. The median score of the participants was 45. The mean score was also 45 with a standard deviation of 11.38. Interquartile range was 37 – 52. On comparison of neuroglycopenic effects score, (Table 2) the mean and median scores of habitual skippers were found to be significantly higher compared to occasional / non skippers. (Mann Whitney U test; W= 611) (p= 0.019).

The neuroglycopenic effects score was comparable among males and females and there was no statistically significant difference of scores between males and females. (p=0.73).Also, habitual breakfast skippers reported less active participation during lectures compared to non-skippers.

Regarding residence of the medical students, habitual and occasional breakfast skipping was higher among hostellers compared to day scholars, however the difference was not statistically significant (p=0.12)

Table 1 : Participant Characteristics

Participant Characteristics (N= 122)	
Gender	n (%)
Male	34 (28%)
Female	88 (72 %)
Residence	
Hosteller	106 (87%)
Day Scholar	16 (13%)
Medical Postings	
Clinical	38 (31%)
Non Clinical	84 (69%)

Table 2 : Comparison of Neuroglycopenic effects score among non/ occasional breakfast skippers with habitual skippers.

Neuroglycopenic Effects Score		Non/ occasional skippers	Habitual skippers
	Mean,	43.94,	51.11,
	SD	10.91	12.43
	Median	44	51
Mann Whitney U test : W = 611 ; p = 0.019			

Discussion

Breakfast skipping is becoming more prevalent in adolescents and university students. Our study reported that up to 40 % of medical students under our study setting skipped breakfast up to 4 days in the past 2 weeks and also, 14.8% medical students were habitual breakfast skippers – skipping breakfast at least 5 days in the past 2 weeks. Therefore the prevalence of breakfast skipping is high. Comparing to the results from western countries – 20% medical students from United States [4], 10 % from France [18] and 27% from Australia were breakfast skippers [19].

There could be many factors contributing to breakfast skipping. Lack of time, oversleeping and not feeling hungry were the common reasons for skipping breakfast from our study population. This was similar to the reasons for skipping breakfast, by students from studies conducted in other regions as well. A study conducted among undergraduate students in a public university in Kuala reported the major reasons for skipping breakfast to be less time to eat, did not like eating at early hours of the day, lack of appetite and getting late to wake up [20]. Lack of adequate sleep at night could result in getting up late and hence having less time to have breakfast. However, studies have reported that poor quality of sleep could result in poor

appetite [21]. It is now known that breakfast with adequate levels of tryptophan help in a healthy diurnal rhythm, good quality of sleep and good mental health [22]. Also, Hostellers were more likely to skip their breakfast compared to day scholars as per our study. This could be due to the adherence to healthy family breakfast eating habits among day scholars.

With regard to neuroglycopenic symptoms during the class hours, our participants reported a higher prevalence of the symptoms like fatigue, irritability, day time sleepiness when they had skipped their breakfast in the morning. Students who had breakfast, reported fewer and less frequent symptoms. On calculating the neuroglycopenic effects score from the 23 symptoms as per the questionnaire, the mean total score was higher for breakfast skippers compared to non-skippers (51.11 vs 43.94) and this was statistically significant (Mann Whitney U test : W = 611 ; p = 0.019). Other studies conducted in students from different parts of the world has also reported similar findings. A study conducted in the university of Ghana medical school reported that students who skipped breakfast experienced difficulty in concentration and fatigue [14]. In a study conducted among medical students in China, they noted that students who perceived their studies to be easy were regular breakfast eaters and their classmates, who perceived their studies to be hard and laborious were regular breakfast skippers [15]. They also reported that these findings showed a dose dependency relationship. Studies have confirmed the influence of breakfast on academic performance and school attendance in young students [23]. An intervention study by providing free breakfast in schools, conducted in Wales have proposed that breakfast interventions results in improved school

performance, better cognitive functioning and behavior and educational achievements [24].

Studies have confirmed that students who skip breakfast regularly are more likely to be obese later in their life compared to students who take breakfast regularly [25]. Also, we have now evidence that students who take breakfast regularly have a better BMI, higher levels of physical activity and cardio-respiratory fitness [9].

The high prevalence of breakfast skipping among medical students and its adverse effects on their health and academic performance are a matter of urgent concern. These medical students, who become health professionals in the future, are to be the role models and promoters of healthy lifestyle and balanced eating habits to the rest of the population. Hence, training them to adopt these healthy habits right from their student days is the need of the hour.

Conclusions

The prevalence of habitual breakfast skipping is high among medical students. These students who skip breakfast regularly experience variety of neuroglycopenic symptoms to a level that it affects their performance during their class hours and clinical sessions. Targeted interventions are required in the medical education system to increase breakfast consumption among medical students.

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Legends Figures

Figure 1: Questionnaire

Questionnaire on breakfast skipping and neuroglycopenic effects on learning

1. Name 2. Age: 3. Sex M/ F 4. Batch.....

5. Are you a : Hosteler day scholar

6. Did you skip breakfast today? Y N

if no what did you have today (write each item with quantity)?

a..... b..... c..... d.....

7. In the 12 working days of past 2 weeks how many times have you **skipped breakfast**?

8. Which department(s) were you posted in for the past 12 working days

9. In the 12 working days of past 2 weeks how often have you had the following problems during forenoon?

Sl.no.	Problems	Never	Only 1 day	2-4 days	5-7 days	8 days /
1	I used to feel a bit anxious					
2	I used to feel depressed					
3	In-between I felt like crying					
4	I used to feel that I am worthless					
5	I used to feel that people around me are not ok					
6	I used to feel that situations are not ok					
7	I used to get irritated easily by other people					
8	I used to get irritated easily in some situations					
9	I used to feel like fighting with someone or the other					
10	I used to feel tired and fatigued					
11	I used to feel sleepy					
12	I used to day-dream					
13	I was unable to concentrate					
14	I used to feel confused					
15	I used to feel lack of enthusiasm					
16	I had blurring of vision in between					
17	I sweat a bit too much					
18	I had tremors in my hand					
19	I had palpitations					
20	I had slurring of speech					
21	I had headache					
22	I had nausea and / vomiting					
23	I used to feel giddiness					

10. How well you used to participate in the learning activities or discussions during postings in the past 12 working days?

- a) I used to take the lead
- b) I used to involve actively
- c) My involvement was ok (satisfactory)
- d) I used to involve for name sake
- e) I used to feel left alone

Figure 2: Comparison of Neuroglycopeniceffects score of habitual breakfast skippers with that of non-skippers

