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EFFECT OF SKIPPING BREAKFAST ON DIFFERENT DOMAINS OF COGNITIVE FUNCTION AMONG UNDERGRADUATE MEDICAL STUDENTS: A CROSS-SECTIONAL STUDY

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Abstract

Introduction Breakfast is considered to play a crucial role in maintaining the physical health and intellectual capabilities of a person. It is central to one's daily nutritional requirement, contributing significantly to the total daily energy and nutrient intake.

Aim: To find out the prevalence of skipping breakfast and its effect with different domains of cognitive function.

Methods: This cross-sectional study was performed in the Postgraduate Department of Physiology, Government Medical College, Jammu for the duration of 6 months from 1st December 2023 to 31st April 2024 on 150 subjects belonging to both sexes from undergraduate medical students. Cognitive function was assessed using validated scales of measurement like FDS (Forward Digit Span) and BDS (Backward Digit Span) for assessing short term and working memory respectively and MMSE (Mini Mental Scale Examination) for assessing global cognitive function. Subjects were required to fill printed Questionnaire. The objectives and benefits of the study were verbally explained to the students followed by obtaining written consent from those who agreed to participate. A written form was attached to the questionnaire with the assurance of confidentiality of the data without affecting their course progress.

Results A good proportion of the students were found to have skipped breakfast either once or more than once in a week (67.3%, 95% CI: 56.18-71.38%). Female students were more likely to skip breakfast compared to male students (adjusted odds ratio, AOR = 1.64, 95% CI: 1.05–2.56). Waking up late (OR- 10), sleeping late (OR-8), and staying in hostels (OR- 9) were the important factors significantly associated ($p<0.05$) with break-fast skipping. All the three scores (FDS, BDS and MMSE) were higher among those who took breakfast.

Conclusion This study indicating positive association between having breakfast and certain domains of cognitive function. Breakfast skipping behavior is high among undergraduate medical students. The students should be encouraged to eat regular breakfast through health promotion campaigns.

Keywords: Breakfast skipping, scales of measurement, medical students, hostel staying, late sleeping, late waking up.

Introduction:

Breakfast is considered to be an important meal of the day following overnight fasting because it provides energy to the brain, which is necessary for learning.[1,2] Glycogen stores are significantly depleted following long overnight fasting. Younger individuals have higher brain glucose metabolism and higher sleep demand. To maintain a higher metabolic rate, especially among young individuals, a continuous supply of energy is needed, which can only be fulfilled by a balanced and healthy breakfast.[3] Glucose being the main fuel for brain function, an optimal cognitive function requires maintenance of a stable blood glucose level. Among schoolchildren, a beneficial cognitive performance due to consumption of breakfast has been demonstrated.[4]

Despite the numerous benefits associated with daily breakfast consumption, the number of people who 'skip' breakfast– hereon defined as skipping breakfast - is globally estimated to be 10 to 30% among children and adolescents [5] and 48% among university students (median age 20 years and 28 countries in Africa, the Americans and Asia) [6]. Skipping breakfast is defined as missing or foregoing breakfast at least once a week either deliberately or unintentionally [7–9]. Reported health consequences of skipping breakfast include an increased risk of overweight, type 2 diabetes, hypoglycemia, hair loss, and migraine headaches [10, 11].

Young adults between the age of 18- 25 years are often the neglected group in any health awareness program compared to other age group of people. These young adults' dietary habits are influenced while they leave home and adjust to independent living in higher education life [12]. They skip breakfast due to lack of time to eat, waking up too late, financial constraints, stress, family eating patterns, lack of appetite, control weight, eating late at night, and class pressure [13].

It is often assumed that undergraduate medical students have a greater knowledge about healthy lifestyles and dietary habits when compared to their non-medical counterparts [14]. The stress of university life and load of medical study could negatively influence their diet. Poor time management is the most commonly cited factor preventing the achievement of a healthier lifestyle among undergraduate medical students [15].

Health personnel usually provide good life style measures for the community [16]. Because the medical students are going to be the future physicians, practicing a healthy dietary habit is important for them so that they can uplift themselves as a role model for the society. Ignoring a healthy lifestyle could be a fiasco towards a health promotion opportunity that can be followed by others [14]. So they can adapt a healthy lifestyle which should be continued after they graduate to provide health care [17]. Thus, medical undergraduates should understand and develop healthy lifestyles by adopting healthy eating patterns as future doctors and promoters of a healthy lifestyle [13].

Methods:

The present study was undertaken in the Postgraduate Department of Physiology, Government Medical College, Jammu for the duration of 6 months from 1st December 2023 to 31st April 2024 on 150 subjects belonging to both sexes from undergraduate medical students of Government Medical college Jammu.

Students in the age group of 18–25 years and willing to participate were included in the study. Those taking alcohol/ smoking or suffering from any cardiovascular/respiratory diseases or on any medication that is likely to affect the cognitive performance were excluded from the study.

Inclusion criteria:

Healthy young adult of both sexes aged between 18 to 26 years.

Exclusion criteria:

1) History of alcoholism, smoking.
2) History of any chronic metabolic or debilitating disease.
3) History of taking any medication.

Cognitive function was assessed using validated scales of measurement like FDS (Forward Digit Span) and BDS (Backward Digit Span) for assessing short term and working memory respectively and MMSE (Mini Mental Scale Examination) for assessing global cognitive function. Subjects were used to be required to fill printed Questionnaire.

Statistical Analysis

Data were analysed using SPSS software (20.0v). Categorical variables were expressed as a percentage and continuous variables were expressed in terms of mean and median. Mann–Whitney U-test was used to compare the medians. $P < 0.05$ was considered statistically significant.

Results:

A profile of 150 students participated in this cross- sectional study. The mean age of the students was 21.29±2.31 years. Female participants (55.33%) outnumbered the males. Maximum number of participants were the first year students (52.66%) fallowed by second year students (20.66%), third year students (16%) and fourth year student (10.66) [Table1].

Table 1: Demographic profile of the study population

Variables	Percentage (mean±SD)
Age (years)	21.29±2.31
Male	**44.66**
Female	**55.33**
First year	**52.66**
Second year	**20.66**
Third year	**16.00**
Fourth year	**10.66**

Only about a quarter of the participants (24.00%) consumed breakfast every day. While 61.5% of the participants skipped breakfast at least 1–3 times a week, 17.9% of the participants skipped more than 3 times a week. About a third (29.8%) of the participants had not taken breakfast on the day of the survey. Further, it was observed that male participants skipped breakfast more frequently than females. The most common reasons for skipping breakfast was either no time (46.29%) or not liking the hostel food (13.15%) [Table 2].

Table 2: Reasons for skipping breakfast among the study population (n=150).

Reasons	Percentage (%)
No time	46.29
Not liking hostel food	13.15
Exam time	7.42
To lose weight	5.29
Stress due to studies	4.28
Wake up late	4.12
Too lazy	3.22

The FDS, BDS and the MMSE scores were compared between the students who skipped breakfast on the day of the survey [Fig 1] or those who usually skipped breakfast [Fig 2] with their counterparts. It was observed that those who usually skipped breakfast or on the day of the survey had consistently lower FDS, BDS and MMSE scores as compared to their counterparts. However, the difference was statistically significant in BDS and MMSE scores among the usual breakfast skippers and non-skippers.

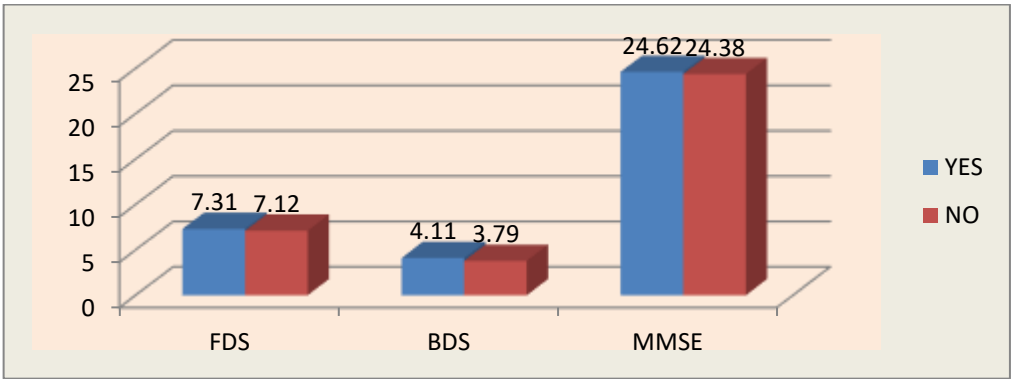

Fig 1

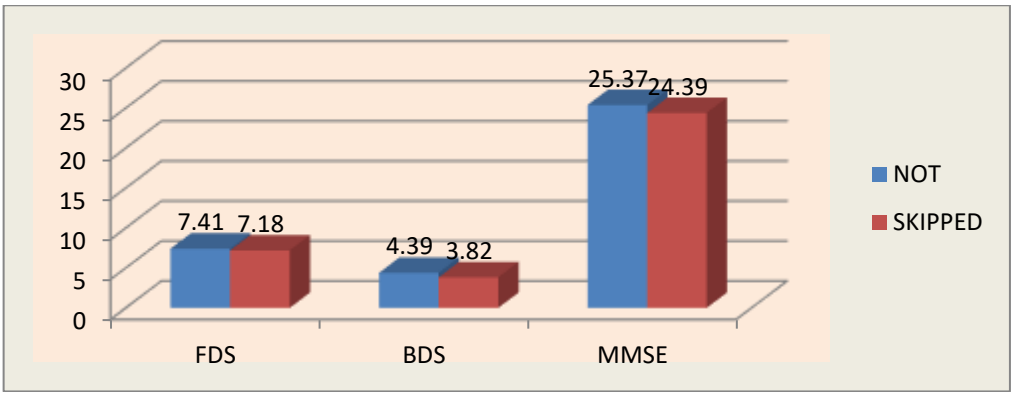

Fig 2

Discussion:

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 [18]. The average cerebral oxygen utilization and cerebral blood flow in these age groups are also higher compared to adults [19]. Students also have higher sleep demands and hence suffer greater depletion of glycogen stores overnight [20]. Hence, a proper breakfast in the morning is vital to meet the metabolic and glycemic needs of the brain.

We aimed to assess the prevalence of skipping breakfast among medical students and its association with different domains of cognitive function. The prevalence of skipping breakfast was almost more than 65% of the participants, either once or more than once a week.

This was similar to the findings of other cross-sectional studies conducted in Karnataka, India,[21] and Ghana.[1] However, studies conducted among the medical students in other parts of India, have reported a much lower prevalence of skipping breakfast [22-27]. In Puducherry, 59.8% of students skipped breakfast at least once a week, 40.8% at least twice a week and 24% skipped at least thrice a week. The prevalence of skipping breakfast was found to be higher among males than the female undergraduates.[22] Almost half of the surveyed medical students in Mangalore (49.7%)[23] and Manipal (47.3%)[24] skipped breakfast. In the Grant Medical College, Mumbai, it was 63%[25] and 32% in Karad,[26] Maharashtra. The lowest percentage of skipping breakfast was reported from Kerala (23%) [27].

There could be many factors contributing to breakfast skipping. Lack of time, over sleeping and not feeling good about hostel food 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 [28] . 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 [29]. 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 [17]. Also, Hostellers were more likely to skip their breakfast compared to day students as per our study. This could be due to the adherence to healthy family breakfast eating habits among day students.

A similar trend of skipping breakfast has been reported globally with only about a quarter of Croatian students reported to have consumed breakfast regularly [30]. An almost similar proportion of medical students has reported having skipped breakfast in Sri Lanka (55.4%) [2] and relatively lower reporting was from Malaysia (43.9%) [31] and China (28.9%).[32] Earlier, research has demonstrated that although medical students have a better understanding about healthy habits, they fail to apply it into practice [31].

In our study, male students were found to skip breakfast more than the females, which is in confirmation of the gender differences observed in other studies.[33, 22] Lack of time and not liking the hostel food were the most common reasons for skipping breakfast in our study setting. Research has also shown that skipping breakfast among medical undergraduates can be attributed to lack of time [32] or the stress of medical study [34]. On the contrary, researchers in other study settings have reported females skipping breakfast more than the males.[35] Females reportedly were more conscious of their body shape and inappropriately skipped breakfast to lose weight.

Available literature did not show any evidence of MMSE being used in the assessment of cognitive function in adolescents and young adults or among medical students for assessing the effects of skipping breakfast. Our study revealed that MMSE and BDS scores were statistically significantly higher among those who usually did not skip breakfast. Although it cannot be ascertained that skipping breakfast has effects on global cognitive functioning due to the design of the study, there exists an association between the two.

Conflict of interest: Nil
Funding: Nil

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