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RESEARCH ARTICLE

EXAMINING THE EFFECTS OF SKIPPING BREAKFAST ON MEDICAL STUDENTS SLEEP QUALITY

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Abstract

Background: Eating breakfast has been associated with better sleep, cognitive performance, and general well-being. Nonetheless, skipping breakfast is still very common among medical students. This study examined how skipping breakfast and other physiological factors impacted medical students sleep patterns.
Methods: 104 medical students (52 who ate breakfast and 52 who skipped it) participated in a cross-sectional study that used the Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality and cognitive performance using a variety of tasks.
Results: In comparison to breakfast eaters,those who skipped breakfast experienced worse sleep quality(PSQI score: 5.04 vs. 3.57, $p < 0.05$)
Conclusion: Eating breakfast regularly is linked to improved sleep quality and cognitive performance, namely working memory, attention, and processing speed, among medical students. These results highlight theimportance of encouraging wholesome breakfast practices to improve academic achievement and general well-being.

Introduction:-

Eating breakfast has been associated with enhanced general well-being, sleep quality and cognitive performance.[1] Due to their busy schedules, many medical students, however skip breakfast. According to research, skipping breakfast may have negative impacts on one's ability to focus and pay attention, as well as memory and problem-solving abilities, physical activity, and sedentary behaviour.[2] Emotional stability and mood management may also suffer if breakfast is skipped. Furthermore, skipping breakfast can result in inadequate energy levels and poor food intake for medical students, raising their risk of obesity, diabetes, and cardiovascular disease. Consequently, productivity and academic achievement may be jeopardized.[3]This study examines how medical students cognitive function, sleep quality, and physiological factors are related to skipping breakfast.

Materials and Methodology:-

Study Design: Observational Study
Study Setting: This study was conducted at Siddhartha Medical College, Vijayawada. Physiological parameter recorded and clinical examinationswereperformed at the department of physiology

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Study Duration: 3 Months
Study Participants: (N=104)
104 Healthy volunteers (52 subjects regularly had breakfast, 52 subjects skipping breakfast more than 3 days a week) were included in this study.

Sample size calculation:-
The sample size was calculated using the formula
$n = (Z1\text{-}a/2)^2 \times p\,(100\text{-}p)/\,d^2$
where P= 49%, 100-p = 51, relative error of 20%
Using the above formula, the derived sample size was 104

Inclusion Criteria: All the First Year MBBS students, Both genders, Students who skipped breakfast atleast 3 times a week (breakfast skippers), Students who regularly consumed breakfast (breakfast eaters group)
Exclusion Criteria: Chronic medical illness on medication, Sleep disorder, Psychiatric illnesses, Drug therapy, Smoking, Alcohol.

Methodology:-

Ethical clearance was first obtained from the Ethics Committee at Siddhartha Medical College, Vijayawada. Volunteers were initially screened for inclusion and exclusion criteria and then classified into breakfast eaters and breakfast skippers based on a comprehensive history of breakfast consumption provided. The study procedure was explained in detail to all participants and written informed consent was obtained. Following this, the study was initiated.

The study protocol included the following steps:
- Recording of general medical history and breakfast habits
- Recording the physiological parameters
- Assessment of sleep quality and pattern of sleep using a standardized questionnaire[4]

Participants personal information, including name, age, address was documented. Additional details were collected on dietary habits,overall medical history, medication usage, menstrual history (for female participants), and personal history.A comprehensive general examination was performed on all participants.

Recording Physiological Parameters:
The resting pulse rate was measured by manually counting the radial pulse for one minute. Blood pressure was recorded in the right upper arm while the participant was seated, using both the palpatory and auscultatory methods. The instruments used for these measurements included a Diamond Deluxe sphygmomanometer and an Elko Alpha Tone stethoscope.

Assessment of Sleep Quality:-
The quality and pattern of sleep were evaluated using a self-reported subjective questionnaire, the Pittsburgh Sleep Quality Index (PSQI). This questionnaire assesses seven aspects of sleep over the past month:
- Subjective sleep quality
- Time taken to fall asleep (Sleep latency)
- Duration of sleep
- Efficiency of habitual sleep
- Disturbances during sleep
- Use of sleep medications
- Daytime dysfunction

These components distinguish between "good" and "poor" sleep. A total PSQI score greater than 5 indicates poor sleep quality, reflecting significant difficulty in at least two areas or moderate difficulty in more than three areas. The PSQI is a validated questionnaire with a Cronbach's α coefficient of 0.83, indicating its reliability[4]

Results:-

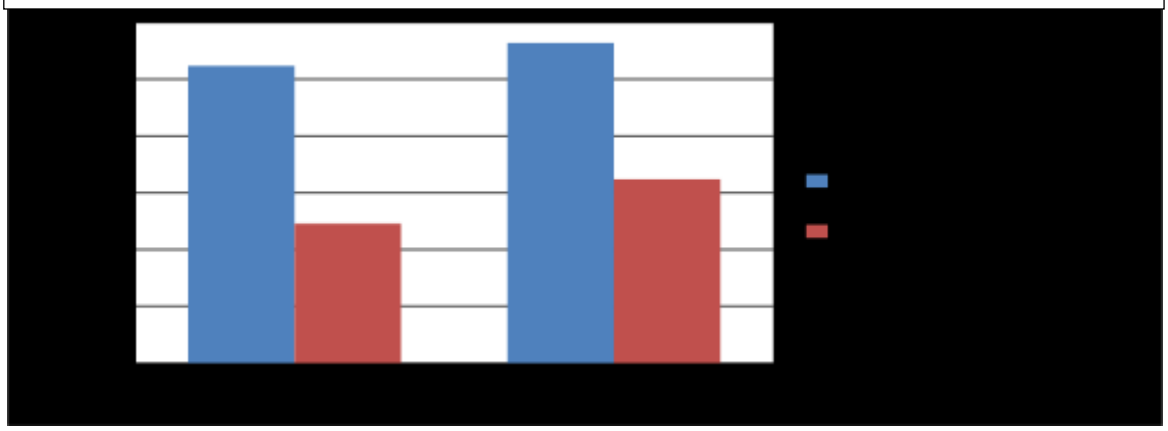
A total of 104 participants were enrolled in the study, with 52 subjects being regular breakfast eaters and 52 subjects being breakfast skippers.

Table 1: DECRIPTIVES AMONG B- EATERS AND B-SKIPPERS

variable	Total		BREAKFAST EATERS				BREAKFAST SKIPPERS			
	MEAN	SD	MIN	MAX	MEAN	SD	MIN	MAX	MEAN	SD
Age	19.42	5.501	18	22	19.23	6.018	18	22	18.62	4.857
Menarche	8.91	6.499	0	15	8.74	6.383	0	17	9.08	6.67
PSQI	4.3	3.002	0	14	3.57	2.422	0	13	5.04	3.351

Age: Breakfast eaters had a mean age of 19.23 years (SD = 6.018, range: 18–22), while skippers had a mean age of 18.62 years (SD = 4.857, range: 18–22). **Menarche Age**: Breakfast eaters had a mean menarche age of 8.74 years (SD = 6.383, range: 0–15), and skippers had a mean of 9.08 years (SD = 6.67, range: 0–17).**PSQI Score**: Breakfast eaters had a mean PSQI score of 3.57 (SD = 2.422, range: 0–13), while skippers had a higher mean PSQI score of 5.04 (SD = 3.351, range: 0–14), indicating poorer sleep quality among skippers.

Figure 1: AGE AND GENDER DISTRIBUTION AMONG B-EATERS AND B-SKIPPERS



This figure illustrates the demographic spread. The sample had 52 males and 52 females evenly distributed in each group (18 males and 34 females in the breakfast eaters and skippers groups), ensuring a balanced gender distribution in the study.

Table 2: GENDER DISTRIBUTION AMONG B-EATERS AND B-SKIPPERS

Variables	Males		Females		Total	
	n	%	n	%	n	%
B-Eater	18	50.0%	34	50.0%	52	50.0%
B-Skipper	18	50.0%	34	50.0%	52	50.0%
Total	36	100.0%	68	100.0%	104	100.0%

This table shows that 104 participants were divided equally between the two groups, with each group containing 50% males and 50% females.

Table 3: Mean age difference among breakfast eaters and skippers

Group	MeanAge (SD)	95% CI	p-value
Breakfast eaters	19.23 (6.018)	0.503 to 3.710	0.134
Breakfast skippers	18.62 (4.857)		

Among Breakfast Eaters**,** the Mean age was 19.23 years (SD = 6.018) while among Breakfast Skippers, the Mean age was 18.62 years (SD = 4.857). The p-value for age difference was 0.134, indicating no statistically significant age difference between the two groups.The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate subjective sleep quality. The frequency distribution of PSQI scores is presented below.

Table 4: Distribution of PSQI Scores Frequency among b-eaters and b-skipper

PSQI	**No of breakfast eaters**	**No of Breakfast skippers**
PSQI < 5	38 (73.08%)	34 (65.38%)
PSQI ≥ 5	14 (26.92%)	18 (34.62%)

Among breakfast eaters, 38 participants (73.08%) had PSQI scores below 5, indicating good sleep quality, while 14 (26.92%) scored 5 or above, indicating poor sleep quality. Among breakfast skippers, 34 participants (65.38%)scored below 5, and 18 (34.62%) scored 5 or above, showing a higher incidence of poor sleep quality among skippers.

Table 5: Mean difference of PQSI score among b-eaters and b-skipper

Group	**Mean PSQI(SD)**	**95%CI**	**p-value**
Breakfast Eaters	3.58(2.424)	-2.599 to 0.346	0.011*
Breakfast skippers	5.05(3.353)		

The mean PSQI score among the Breakfast Eaters was 3.58 (SD = 2.424) while among Breakfast Skippers,the Mean PSQI score was 5.05 (SD = 3.353). The p-value of 0.011 indicates a statistically significant difference in PSQI scores between breakfast eaters and skippers, with skippers experiencing poorer sleep quality.

Table 6: Mean difference of age of menarche Among B-Eaters And B-Skipper

Group	Mean(SD)	95% CI	p-value
Breakfast Eaters	13.24(1.061)	-1.113 to 0.085	0.091
Breakfast Skippers	13.75(1.422)		

Mean age at menarche among b-eaters was 13.24 years (SD = 1.061) while in Breakfast Skippers the Mean age at menarche was 13.75 years (SD = 1.422). The p-value of 0.091 suggests no significant difference in the age of menarche between breakfast eaters and skippers

Discussion:-

There is inconsistency in the definition of 'Breakfast' across previous studies. Preziosi et al. described breakfast as the consumption of solid food or a beverage for the first time after waking from overnight sleep[5] Yang et al. defined breakfast as any food consumed before 9:00 a.m., regardless of the meals content[6]Timlin and Pereira characterized breakfast as the first meal of the day,eaten within two hours of waking, generally before or at the start of daily activities, and not later than 10:00 a.m., with a caloric intake accounting for 20-35% of daily energy requirements.[3]In our study, breakfast is defined according to the criteria established by Timlin et al., which is widely used for research purposes.

Gender Differences In Breakfast Habits:-

In our study, randomly recruited breakfast-skipping participants included a higher proportion of women (66.04%) compared to men (33.96%). Previous research has consistently shown gender-specific differences in breakfast consumption patterns. Our findings align with these studies, indicating that women are more likely to skip breakfast than men.[7,8,9] This higher prevalence of breakfast skipping among women may be attributed to the common misconception that it aids in weight reduction.These results suggest a need for increased emphasis on encouraging better breakfast habits among females.[10]

Effects Of Breakfast Habits On Sleep:-

In our study, the quality and pattern of sleep, as assessed by the Pittsburgh Sleep Quality Index (PSQI), revealed that breakfast skippers had a higher mean PSQI score (5.04) compared to breakfast eaters (3.57), with the difference being statistically significant. This indicates that breakfast skippers experience poorer sleep quality than those who eat breakfast regularly.Our findings are consistent with a study conducted by Juan Sun, which demonstrated a significant association between regular breakfast consumption and better sleep quality.The physiological mechanism underlying these effects suggests that breakfast containing adequate tryptophan is metabolized into serotonin, a potent antidepressant that promotes a morning-type diurnal rhythm. At night, serotonin is converted into melatonin in the pineal gland, which induces sleep, thus contributing to better sleep quality.[11,12,13]

Circadian rhythm is significantly influenced by metabolism and food intake, and breakfast skipping can lead to alterations in circadian rhythmicity[14.] Additionally, our results align with a study by Lan Wang et al., which found a clear association between breakfast skipping and poor sleep quality.[15]Midori Nishiyama et al. also investigated the unhealthy behaviors associated with breakfast skipping and found that individuals who skip breakfast tend to have poorer sleep quality.[16]These findings further support our study.Cheng et al. conducted a study using the same PSQI scale and observed a significant correlation between poor sleep quality and breakfast skipping habits, further corroborating our observations.[17]

Limitations:-

- Breakfast consumption was self-reported and subject to interpretation, potentially resulting in information bias.
- There is no standardized definition of breakfast in the existing literature, which may contribute to variations in results.

- The study population consisted of an unequal number of males and females, which could have affected the results.
- The quantity, type, and composition of breakfast were not recorded, limiting the ability to determine the detailed cause of the findings.
- Sleep patterns and sleep quality were assessed using a subjective questionnaire, which may lead to recall bias

Recommendations:-

- Future studies should include detailed assessments of food intake using 24-hour recall or food-frequency questionnaires to better understand the relationship between skipping breakfast and other physiological parameters.
- Gender should be matched in future studies for better comparison.
- The study should be conducted with a larger sample size and a wider age range for more robust results.

References:-

1. Ackuaku-Dogbe E, Abaidoo, B. Breakfast eating habits among medical students. Ghana Med J 2014;48:66-70.
2. Liyanage G, Siriwardana HD, Wettasinghe CA, Kumarasiri MK, Niwanthika TK. Breakfast habits and its relationship to body mass index, cognitive function among final year medical students. J Gen Pract 2017;5:8-11.
3.Timlin MT, Pereira MA. Breakfast frequency and quality in the etiology of adult obesity and chronic diseases.Nutr Rev. 2007;65:268–81
4 Buysee DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res.1989;28(2):193-213.
5 Sivaramakrishnan M, Kamath V.A typical working-day breakfast among children, adolescents and adults belonging to the middle and upper socio-economic classes in Mumbai, India–challenges and implications for dietary change.Public health nutrition. 2012 Nov 1;15(11):2040-6.
6 Yang RJ, Wang EK, Hsieh YS, Chen MY.Irregular breakfast eating and health status among adolescents in Taiwan.BMC Public Health. 2006;6:295.
7. Sajjad A, Anwer M, Anwer S, Zaidi SA, Hasan A. Missing breakfast, sleep and exercise: are you skipping out years of life. Journal of Nutrition and Health Sciences. 2014 Nov 7;1(3):1.
8 .DESHMUKH-TASKAR PR, NICKLAS TA, O'NEIL CE, KEAST DR. The Relationship of Breakfast Skipping and Type of Breakfast Consumption with Nutrient Intake and Weight Status in Children and Adolescents: The National Health and NutritionExamination Survey 1999-2006. J Am Diet Assoc. 2010;110:869-78.
9. Smith KJ, Gall SL, McNaughton SA, Blizzard L, Dwyer T, Venn AJ: Skipping breakfast: longitudinal associations with cardiometabolic risk factors in the Childhood Determinants of Adult Health Study.AmSocNutr 2010, 92:1316–1325.
10 Pal GK. A good breakfast is good for health. International Journal of Clinical and Experimental Physiology. 2016 Jan 1;3(1):1
11. Sun J, Yi H, Liu Z, Wu Y, Bian J, Wu Y, Eshita Y, Li G, Zhang Q, Yang Y. Factorsassociated with skipping breakfast among Inner Mongolia Medical students in China. BMC Public Health. 2013 Jan 17;13(1):42.
12. Nakade M, Akimitsu O, Wada K, Krejci M, Noji T, Taniwaki N, Takeuchi H, Harada T. Can breakfast tryptophan and vitamin B6 intake and morning exposure to sunlight promote morning-typology in young children aged 2 to 6 years?.Journal of physiological anthropology. 2012 May 22;31(1):11.
13. Harada T, Hirotani M, Maeda M, Nomura H, Takeuchi H. Correlation between breakfast tryptophan content and morningness–eveningness in Japanese infants and students aged 0–15 yrs. Journal of physiological anthropology. 2007;26(2):201 7.
14. Froy O. The relationship between nutrition and circadian rhythms in mammals. Frontiers in neuroendocrinology. 2007 Sep 30;28(2):61-71.
15.Wang L, Qin P, Zhao Y,Duan S, Zhang Q, Liu Y, Hu Y, Sun J. 9572Prevalence andrisk factors of poor sleep quality among Inner Mongolia Medical University students:across-sectional survey.Psychiatry Research 2016 Jul19
16. Nishiyama M, Muto T, Minakawa T, et al. The combined unhealthy behaviors of breakfast skipping and smoking are associated with the prevalence of diabetes mellitus. Tohoku J Exp Med 2009;218:259-64.
17. Cheng SH, Shih CC, Lee IH, Hou YW, Chen KC, Chen KT, Yang YK, Yang YC. A study on the sleep quality of incoming university students.Psychiatry research. 2012 May 30;197(3):270-4.