



Frequency of Breakfast Consumption and its Association with Depression, Bullying and Sleep in American High School Students

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Study Aim/Purpose

This research studies the associations between the frequency of eating breakfast, and a representation of biopsychosocial variables: sleep, prolonged feeling of hopelessness as a factor of mental health, and being bullied, among American high school students.

Study Importance

According to the 2021 YRBS data, between 30% and 40% of American high school students face mental health challenges on a regular basis, 22.8% are bullied, and 48.2% get fewer than 7 hours of sleep on an average school night (Centers for Disease Control and Prevention, 2023). These statistics reflect that a significant percent of American adolescents are struggling in at least one dimension. The frequency of breakfast consumption has been shown to have a significant impact on adolescents' mental health. Looking at its association with the well-being factors mentioned above, if proven significant, may help spot the teenagers who struggle earlier and be proactive about offering them support.

Research Hypotheses

- H1:** There is an association between the frequency of having breakfast, and feeling sad or hopeless for at least 2 weeks in the past year.
- H2:** Those who have been bullied in the last year are less likely to eat breakfast.
- H3:** There is an association between the frequency of having breakfast and the amount of hours of sleep during an average school night.

Results Table

Days of Eating Breakfast					
Feeling sad at least 2 weeks last year	Mean	SD	N	t	p
Yes	2.64	2.499	6303	-29.882***	< .001
No	3.89	2.68	9541		

Bullying exposure	Mean	SD	F	p	Post Hoc Tests
None	3.53	2.694	88.33***	<.001	None > Either, Either > Both
Either electronically or at school	3.12	2.592			
Both electronically and at school	2.63	2.531			

Average hours of sleep on a school night	None: 0-1 days	Some: 2-4 days	Most: 5-7 days	χ ²	p
Less than 7hrs	63.0%	52.4%	33.1%	861.214***	<.001
7hrs or more	37.0%	47.6%	66.9%		

*** p < .001

Discussion and Implications

This study explored whether (1) feeling sad or hopeless for at least 2 weeks in the past year, (2) getting bullied electronically or on school premises in the past year, and (3) the number of hours of sleep on an average school night are associated with the frequency of eating breakfast. The hypotheses tests showed statistical significance for each one : students who eat breakfast less frequently are also more likely to feel hopeless, to be bullied and to sleep less than 7hs on a school night. Since this data was collected soon after COVID epidemic, and behaviors of schools and teens and teens' families may have been different due to adjusting to remote school and remote work, thus the hypotheses should be tested on more recent data. More research should be done to understand better breakfast consumption by high schoolers. It is likely to be affected by whether student participates in School Breakfast Program, and whether it is free. It is also likely to be affected by economic status, as well as perceptions of weight and even gender of the students. Additionally, nutritional value of breakfast may be worthwhile looking into, as a study of high schoolers in Spain (Ferrer-Cascales et al., 2018) found that quality of breakfast is even more important for mental health outcomes than skipping or not skipping breakfast. Qualitative studies may help provide insights into relationship between fewer breakfasts and less sleep, which is a patterns opposite to that noted in Japanese high schoolers (Nagao et al., 2025).

Data Analysis

To check signficance of associations, each Hypothesis had a different test as follows. Independent-samples t-test was used for H1, as Days of Eating Breakfast is a ratio variable, and Feeling Sad is a 2-categories nominal variable. One-way ANOVA was used for H2, as Days of Eating Breakfast is a ratio variable, and Bullying Exposure is a 3-categories nominal variable. Chi-Square test was used for H3 as Days of Eating Breakfast was re-coded into a 3-variable nominal variable and Average Hours of Sleep on a Shool Night was recoded into a 2-category nominal variable. Correlation test could have been used for H3 if both variables remained interval/ratio; however, Chi-square test was perceived as more informative in this particular case. Alpha was set at p<0.05 for all tests.

Core Findings

- H1:** The t-test analysis indicates that there is a statistically significant difference between the mean days of eating breakfast for those who did and did not feeling sad or hopeless for at least 2 weeks in the past year (t (14128.709) = -29.882, p < .05). The null hypothesis is rejected. On average, those who did feel sad/hopeless had 2.64 breakfasts oer week (SD=2.499) whereas those who did not feel sad, were more likely to eat breakfast (M=3.89, SD=2.680).
- H2:** The oneway ANOVA indicates that there is a statistically significant relationship between the number of days of eating breakfast and being bullied. (F=88.333, df=2,15567, p<.05). The null hypothesis is rejected. Bonferroni's post-hoc paired comparison test revealed that participants who were not bullied, ate breakfast on significantly more days (M=3.53,SD=2.694); those who were bullied either at school or electronically ate breakfast less frequently (M=3.12,SD=2.592), while those who were bullied both at school and electronically had the lowest breakfast consumption of an average of 2.63 days a week (SD=2.531).
- H3:** Chi Square test shows statistically significant differences between the respondents depending on their sleep patterns, and their frequency of breakfast consumption. The respondents who got fewer than 7 hours of sleep, were the most likely to never eat breakfast (63.0%) than the students who got 7+ hours of sleep (37.0%). They were somewhat more likely to eat breakfast some of the week (52.4% vs 47.6%), and least likely to eat breakfast most of the week (33.1%) than their longer-sleeping counterparts (66.9%). (χ² = 861.214, df = 2, p < .001 which is less than our .05 alpha level). The test is valid as 0 cells had expected count less than 5, thus the criterion for appropriate use of Chi Square test statistic is passed.

References

Centers for Disease Control and Prevention. (2023). 2021 Youth Risk Behavior Survey Data. <https://www.cdc.gov/yrebs/index.html>

Ferrer-Cascales, R., Sánchez-SanSegundo, M., Ruiz-Robledillo, N., Albaladejo-Blázquez, N., Laguna-Pérez, A., & Zaragoza-Martí, A. (2018). Eat or Skip Breakfast? The Important Role of Breakfast Quality for Health-Related Quality of Life, Stress and Depression in Spanish Adolescents. *International Journal of Environmental Research and Public Health*, 15(8), 1781. <https://doi.org/10.3390/ijerph15081781>

Nagao, S., Sasawaki, Y., Inokawa, H., Kitagawa, N., Takashima, N., & Yagita, K. (2025). Association Between Multi-Dimensional Sleep Health and Breakfast Skipping in Japanese High School Students. *Nutrients*, 17(18), 3005. <https://doi.org/10.3390/nu17183005>