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Association between breakfast habits and learning concentration among elementary school students

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Abstract

Background: Breakfast is an important health behavior that helps meet children's energy needs and supports cognitive function, particularly learning concentration. School-age children who regularly skip breakfast may experience inadequate glucose intake, even though glucose is the primary energy source for the brain. This condition can reduce their ability to concentrate during classroom learning.
Purpose: To determine the relationship between breakfast habits and learning concentration among students in grades IV-VI.
Method: A quantitative approach with a cross-sectional design. A total of 59 students at SDN Ujung Karang, North Lampung Regency, in 2026. The students were included as respondents using a total sampling technique. Data were collected through questionnaires assessing breakfast habits and learning concentration. The data were analyzed using univariate and bivariate analyses, with the Pearson Chi-Square test used to examine the relationship between the variables.
Results: 22 respondents (37.3%) had breakfast habits in the sufficient category. Regarding learning concentration, 20 respondents (33.9%) were classified as having good concentration, while another 20 respondents (33.9%) were classified as having poor concentration. The statistical analysis obtained a p-value of 0.000 ($p < 0.05$), indicating a significant relationship between breakfast habits and students' learning concentration.
Conclusion: Breakfast habits were significantly associated with learning concentration among elementary school students. Regular breakfast may help provide sufficient energy and support students' ability to concentrate during the learning process.

Keywords: Breakfast Habits; Child Nutrition; Elementary School Students; Health Behavior; Learning Concentration.

INTRODUCTION

Breakfast is an important part of the daily diet because it provides the first source of energy after the body has gone without food for approximately 8-10 hours during nighttime sleep. Eating breakfast helps maintain stable blood glucose levels, which serve as the main source of energy for the brain in carrying out cognitive functions, including thinking, understanding information, remembering, and maintaining focus (Feye, Gobena, Brewis, & Roba, 2023).

Adequate glucose intake in the morning plays an important role in supporting children's physical and mental readiness before they begin learning activities at school. When children do not receive sufficient food intake in the morning, they may experience reduced energy, fatigue, and difficulty concentrating during the learning process (Gibson-Moore, Spiro, & Stanner, 2023).

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For elementary school-age children, morning energy intake is especially important because they are already involved in various physical and learning activities from the beginning of the day. These activities require physical readiness as well as the ability to think and process information. A balanced and nutritious breakfast can help meet the body's energy needs and support brain function in receiving and processing information. Therefore, children who eat breakfast are generally better prepared to participate in learning activities at school (Chak, Saraswat, & Kashyap, 2025).

International research has shown that children who regularly eat breakfast tend to have better focus, memory, and academic performance than children who skip breakfast. A breakfast containing balanced nutrients also plays a role in supporting students' cognitive performance and readiness to learn at school (Ong, Lao, Seow, Dave, & Ling, 2023).

Irregular breakfast habits among school-age children are not only a concern in Indonesia but also a global issue. Research published in the journal *BMC Pediatrics* reported that approximately 10-30% of school-age children do not eat breakfast regularly. Several factors may contribute to this condition, including limited time in the morning, lack of appetite after waking up, and family habits that have not supported a regular eating pattern (Sincovich, Moller, Smithers, Brushe, Lassi, Brinkman, & Gregory, 2022). A recent systematic review also found that breakfast-skipping habits among children and adolescents were associated with an increased risk of nutritional problems, poor dietary quality, and long-term health problems (Fischer, Thomas, Ierodiakonou, van Zutphen-Küffer, & Garcia-Larsen, 2025).

In Indonesia, the 2024 report from the National Food Agency Foundation showed that 47.7% of children aged 6-12 years had not met their minimum energy needs at breakfast. In addition, approximately 65% of school-age children had not made breakfast part of their daily routine (National Food Agency, 2024; Global Child Nutrition Foundation, 2024).

A similar condition was also found in Lampung Province. In 2025, 57.7% of elementary school students in Lampung were not accustomed to eating breakfast. Meanwhile, in North Lampung Regency, only 42.9% of students regularly ate breakfast. These findings indicate that many children are still at risk of experiencing insufficient energy intake in the morning, which may affect their ability to concentrate during the learning process (Aqilah, Setiawan, Fakhruddin, & Ummah, 2025).

Learning concentration refers to a student's ability to focus attention on learning activities so that the information delivered by the teacher can be received and understood properly. Students' concentration during learning can be influenced by several factors, including physical condition, energy levels, and mental readiness (Saputri & Eristiawan, 2024).

Adequate energy availability helps students maintain their focus and attention throughout the learning process. In contrast, students who do not eat breakfast are more likely to feel tired, sleepy, less enthusiastic, and have difficulty maintaining attention while participating in classroom activities (Noviyanti & Kusuaryati, 2022).

Several previous studies have demonstrated a relationship between breakfast habits and learning concentration among elementary school children. Apriani & Irvan (2025) found a significant relationship between breakfast and learning concentration, with a p-value of 0.001 (Apriani, & Irvan, 2025). Similarly, Barokah et al. (2022) reported that students who regularly ate breakfast had better levels of learning concentration than students who rarely ate breakfast (Barokah, Jaenudin, & Pratiwi, 2022). Herayeni et al. (2024) also found a fairly strong relationship between breakfast habits and learning concentration among elementary school students, with a p-value of <0.05 and a correlation coefficient of r = 0.507 (Herayeni, Hernanda, Wijayanto, & Setiawan, 2024). International research has also indicated that breakfast is positively associated with children's academic performance and their ability to concentrate during learning activities (Chak et al., 2025).

RESEARCH METHOD

A quantitative approach with a cross-sectional design. This design was selected to examine the relationship between breakfast habits and learning concentration among students in grades IV-VI at SDN Negeri Ujung Karang, North Lampung Regency, in 2026. The independent and dependent variables were measured at the same point in time. The study was conducted at SDN Negeri Ujung Karang, North Lampung Regency, in 2026. The study population consisted of all students in grades IV–VI, with a total of 59 students. The respondents were selected using

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a total sampling technique, meaning that all members of the population who met the research criteria were included in the study.

The independent variable in this study was breakfast habits, while the dependent variable was students' learning concentration. Data were collected using a breakfast habits questionnaire and a learning concentration questionnaire. Both questionnaires had been tested for validity and reliability before being used for data collection. The collected data were processed through several stages, including editing, coding, data entry, and cleaning. Editing was conducted to check the completeness and consistency of the respondents' answers. Coding was used to assign numerical codes to each response, while data cleaning was performed to identify and correct possible errors before statistical analysis.

Data analysis consisted of univariate and bivariate analyses. Univariate analysis was used to describe the frequency distribution and percentage of each research variable. Bivariate analysis was performed using the Pearson Chi-Square test to determine the relationship between breakfast habits and learning concentration among students. The relationship was considered statistically significant when the p-value was less than 0.05. The data were analyzed using a statistical software program. The results of the analysis were presented in frequency distribution tables and cross-tabulation tables showing the relationship between breakfast habits and students' learning concentration.

RESEARCH RESULTS

Table 1. Distribution of Respondent Characteristics and Study Variables (N=59)

Variable	Result
Age (Mean±SD)(Range)(Year)	**(10.98 ± 0.88) (9–12)**
Age (n/%)	
9 years	2/3.4
10 years	17/28.8
11 years	20/33.9
12 years	20/33.9
Gender (n/%)	
Male	26/44.1
Female	33/55.9
Breakfast Habits (n/%)	
Poor	16/27.1
Sufficient	22/37.3
Good	21/35.6
Learning Concentration (n/%)	
Poor	20/33.9
Sufficient	19/32.2
Good	20/33.9

Table 1 shows that the respondents had a mean age of 10.98 ± 0.88 years, with an age range of 9–12 years. The largest age groups were students aged 11 and 12 years, each consisting of 20 respondents (33.9%). Students aged 10 years accounted for 17 respondents (28.8%), while only 2 respondents (3.4%) were aged 9 years. Based on gender, more than half of the respondents were female, comprising 33 students (55.9%), while 26 respondents

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(44.1%) were male. Regarding breakfast habits, the largest proportion of respondents was in the sufficient category, with 22 students (37.3%). This was followed by the good category with 21 students (35.6%) and the poor category with 16 students (27.1%). The mean breakfast-habit category score was 2.08 ± 0.79. The distribution of learning concentration was relatively balanced. A total of 20 students (33.9%) had poor learning concentration, 19 students (32.2%) had sufficient concentration, and 20 students (33.9%) had good concentration.

Table 2. Relationship Between Breakfast Habits and Learning Concentration Among Students (N=59)

Breakfast Habits	Poor Concentration	Sufficient Concentration	Good Concentration	p-value
Poor	11/68.8	5/31.2	0/0.0	
Sufficient	8/36.4	10/45.4	4/18.2	**<0.001**
Good	1/4.8	4/19.0	16/76.2	

Table 2 shows a clear difference in learning concentration according to students' breakfast habits. Among students with poor breakfast habits, 11 students (68.8%) had poor learning concentration, 5 students (31.2%) had sufficient concentration, and none had good concentration. Among students with sufficient breakfast habits, the largest proportion had sufficient learning concentration, accounting for 10 students (45.4%). In contrast, students with good breakfast habits were more likely to demonstrate good learning concentration. Of the 21 students in this category, 16 students (76.2%) had good concentration, 4 students (19.0%) had sufficient concentration, and only 1 student (4.8%) had poor concentration. The Pearson Chi-Square test produced a *p*-value of <0.001. Since the *p*-value was lower than 0.05, there was a statistically significant relationship between breakfast habits and learning concentration among students. Students with better breakfast habits tended to have better learning concentration than those with poor breakfast habits.

DISCUSSION

The findings showed that breakfast habits among students in grades IV–VI at SDN Negeri Ujung Karang were predominantly in the sufficient category, involving 22 respondents (37.3%). A further 21 students (35.6%) had good breakfast habits, while 16 students (27.1%) were classified in the poor category. This distribution indicates that breakfast has become part of the morning routine for many students, although the practice has not yet been carried out consistently. A similar pattern was reported by Apriani and Irvan (2025) and Barokah et al. (2022), who found that breakfast habits among elementary school students generally remained in the sufficient category and had not been fully established as a daily routine (Apriani & Irvan, 2025; Barokah et al., 2022).

Herayeni et al. (2024) also found that some students did not eat breakfast regularly, even though they understood its importance for health and learning activities (Herayeni et al., 2024). This problem is not limited to Indonesia. Globally, approximately 10-30% of children are reported to skip breakfast regularly. Limited time in the morning, low appetite after waking up, and insufficient family support are among the factors associated with this behavior (Sincovich et al., 2022).

Field observations revealed that several students skipped breakfast because they woke up late, did not feel hungry, or were not accustomed to eating in the morning. In the researcher's view, this condition suggests that knowing the benefits of breakfast does not necessarily lead to regular practice. The development of breakfast habits also depends on a consistent morning routine and support from the family environment. Without such support, students may find it difficult to make breakfast a regular part of their daily activities.

The distribution of learning concentration was relatively balanced. Good and poor concentration were each found in 20 respondents (33.9%), whereas 19 respondents (32.2%) were in the sufficient category. These findings demonstrate that students' ability to maintain attention during lessons varied considerably, and optimal concentration had not been achieved by all respondents. Learning concentration refers to an individual's ability to direct attention toward learning activities for a certain period without being easily disturbed by other stimuli (Desmita, 2019).

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Concentration is essential to cognitive functioning because it supports the process of receiving, understanding, processing, and retaining information. Students who are able to concentrate tend to understand learning materials more easily, complete assignments appropriately, and participate effectively in classroom activities. In contrast, limited concentration may cause students to become distracted and experience difficulty understanding the information delivered by the teacher.

Students' concentration can be affected by both internal and external conditions, including physical health, motivation, the learning environment, sleep patterns, nutritional intake, and readiness to learn. Adequate nutrition, particularly in the morning, provides the energy needed by the brain to maintain attention during lessons. Low motivation and environmental distractions may further reduce students' ability to focus. Wulandari and Yuswantoro (2026) similarly stated that sleep patterns, dietary habits, and learning readiness influence students' concentration levels (Wulandari & Yuswantoro, 2026).

During field observations, students with poor learning concentration appeared easily distracted, paid little attention to the teacher's explanation, seemed weak and unenthusiastic, and frequently engaged in activities unrelated to the lesson. According to the researcher, these behaviors may be related to inadequate energy intake and insufficient preparation before participating in classroom learning. When students begin the school day without sufficient physicalulandari and Yuswantoro (2026) similarly stated that sleep patterns, dietary habits and mental readiness, maintaining attention for an extended period becomes more difficult.

The bivariate analysis confirmed a significant relationship between breakfast habits and learning concentration, with a p-value of 0.000 ($p < 0.05$). Cross-tabulation showed that students with poor breakfast habits were more likely to have poor learning concentration. In contrast, most students with good breakfast habits demonstrated good concentration. This pattern suggests that regular breakfast consumption is associated with a greater ability to remain focused during the learning process.

The association can be explained by the physiological role of breakfast in restoring the body's energy supply after an overnight fasting period. Almatsier et al. (2011) stated that breakfast helps meet energy requirements and provides glucose, which is the main source of energy used by the brain (Almatsier, Soetardjo, & Soekatri, 2011). When glucose availability is adequate, cognitive functions such as thinking, remembering, understanding information, and concentrating can operate more effectively. Conversely, skipping breakfast may reduce blood glucose levels, causing fatigue, drowsiness, reduced alertness, and difficulty focusing during lessons.

A balanced and nutritious breakfast also contributes to maintaining stable blood glucose levels throughout the morning. This stability allows students to sustain their attention for a longer period and take part in classroom activities more effectively (Hardinsyah, 2017). Therefore, the relationship identified in this study is not merely associated with whether students eat in the morning, but also reflects the role of adequate energy intake in supporting brain function and learning readiness.

Evidence from international studies further supports the importance of breakfast during school age. Achbani et al. (2025) described breakfast patterns among children aged 6–12 years as part of the formation of daily food consumption and healthy eating habits from an early age (Achbani, Ben Rami, Lagsir, Rouhi, Bouchriti, Kharbach, & Sine, 2025). This indicates that elementary school is an important period for establishing nutritional behaviors that may continue into later stages of life.

Ali et al. (2025) reported that habitual breakfast consumption was associated with improved cognitive ability and academic performance among students aged 6–15 years (Ali, Idris, Al Foraih, Dawi, Mohammed, & Ibrahim, 2025). Regular morning food intake may therefore contribute to better learning functions by providing the energy required for attention, memory, and information processing.

Arora (2022) also explained that breakfast has a positive effect on children's cognitive functions, particularly attention and thinking processes involved in classroom learning (Arora, 2022). This finding reinforces the view that breakfast contributes to students' cognitive readiness before receiving and understanding subject matter.

Comparable findings were reported by Gayathri and Khumbar (2025), who found that students accustomed to eating breakfast tended to achieve better academic outcomes than those who skipped it

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(Gayathri & Khumbar, 2025). Anderson et al. (2018) further emphasized that the quality of food provided and consumed at school, including breakfast, is associated with improved academic performance (Anderson, Gallagher, & Ritchie, 2018).

Overall, regular breakfast habits play an important role in supporting students' learning readiness by providing energy, maintaining cognitive function, and helping them sustain attention during lessons. Establishing this behavior requires cooperation between parents, teachers, and schools. Parents can prepare breakfast and develop an organized morning routine, while teachers and schools can provide education and encouragement regarding the importance of eating before learning activities begin. Such support may help breakfast become a consistent healthy behavior and contribute to a more effective learning process.

CONCLUSION

Breakfast habits among students were predominantly in the sufficient category. Students' learning concentration showed a relatively balanced distribution across the poor, sufficient, and good categories. The Pearson Chi-Square test indicated a statistically significant relationship between breakfast habits and learning concentration ($p < 0.001$). Students with poor breakfast habits were more likely to have poor learning concentration, whereas those with good breakfast habits tended to demonstrate better concentration during classroom activities. These findings indicate that regular breakfast is associated with students' readiness and ability to maintain attention throughout the learning process. Therefore, developing consistent breakfast habits should be encouraged through the involvement of parents, teachers, and schools as part of efforts to support healthy behavior and improve students' learning readiness.

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