

Influence of Breakfast Consumption on Academic Performance among Students

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Citation: Kiran, K. (2026). Influence of Breakfast Consumption on Academic Performance among Students. International Journal of Education, Modern Management, Applied Science & Social Science, 08(03(II)), 36–40.
[https://doi.org/10.62823/IJEMMASSS/8.3\(II\).9353](https://doi.org/10.62823/IJEMMASSS/8.3(II).9353)

ABSTRACT

Breakfast can be a vital source of energy and nutrition for students following the fasting period throughout the night. The literature on studies carried out in children and young people indicates that eating breakfast can help improve attention, memory, executive functions, and other cognitive functions, especially in the morning (Adolphus et al., 2016). Consistent intake of breakfast meals has also been linked to the consumption of better diets and improved educational results among some populations. Nevertheless, the impact of breakfast on academic success is rather complex and may depend on many factors, such as socioeconomic position, nutritional state, family conditions, and others (Adolphus et al., 2013; Lundqvist et al., 2019). Eating breakfast irregularly has been found to be correlated in some studies with worse academic performance and higher psychological distress in adolescents. At the same time, such links do not imply a cause-and-effect relationship (Lien, 2007). Thus, promoting breakfast consisting of whole grains or other complex carbohydrates, proteins, fruits/vegetables, and fats is beneficial for improving nutritional status and preparation for studying.

Keywords: Breakfast, Students, Nutrition, Cognition, Academic Performance, Adolescents, Healthy Diet.

Introduction

There are many factors that influence academic success, such as cognition, health, well-being, socioeconomics, sleep and nutrition. Breakfast is a specific nutrition behavior that is widely studied because it is eaten after a relatively long fast overnight and provides people with nutrients and energy before starting school. Some research on the impact of breakfast consumption on cognition among children and adolescents suggest that eating breakfast has some benefits for different aspects of cognition, especially for attention, memory, and executive function (Adolphus et al., 2016).

Breakfast is often missed by teenagers and young people. The reasons are time, lack of appetite in the morning, preferences regarding lifestyle, body weight issues and socioeconomic status. For example, a large study carried out among Norwegian adolescents found that breakfast missing was associated with higher risks of mental distress and poor academic results, but the cross-sectional nature of the study implies that there could be some other factors that explain these associations (Lien, 2007). Similar findings were obtained during other studies carried out among other population groups, where the association was observed between breakfast missing and academic performance, including mathematical and linguistic subjects (Kim et al., 2016; Adolphus et al., 2013).

A healthy breakfast may also improve diet quality. Individuals eating breakfast on a regular basis have more chances to meet their micronutrient and macronutrient needs during the day (Adolphus et al., 2016). As a result, in addition to being calorie rich, breakfasts must be nutritionally well-balanced as well.

On the other hand, one must approach statements about breakfasts cautiously. There is some evidence supporting the role of breakfast in the improvement of short-term cognitive functions; however, there is no consistent evidence regarding the effect of breakfasts on academic performance in the long term. Various factors, such as socioeconomic status, nutritional status, family characteristics, and other health behaviours, affect both breakfast consumption and academic results (Adolphus et al., 2013; Lundqvist et al., 2019).

Cognitive Benefits of Breakfast

- **Attention and Concentration**

In order to listen to lecturers, read the study material, do tasks and engage in class work, learners require sustained attention. According to the results of a systematic review of intervention researches, breakfasting had better effects on the measures of attention and other aspects of cognition in children and adolescents as opposed to fasting (Adolphus et al., 2016). This effect might be especially important in the morning because learners had just finished fasting overnight.

- **Memory and Learning**

The brain requires memory to be able to learn new information. Studies discussed in the literature by Adolphus et al. (2016) show that eating breakfast may have positive influences on memory tests. An observational study conducted among schoolchildren showed that children who ate breakfast did well in tests involving attention and episodic memory when compared to those who did not eat breakfast (Wesnes et al., 2012).

- **Executive Function and Problem Solving**

Executive functions involve processes like planning, working memory, mental flexibility, and attention control. Executive functions are critical for problem-solving and for handling academic challenges. The existing experimental data show that breakfast might enhance some elements of executive function in children and adolescents, but the effect depends on the type of tasks and design of studies (Adolphus et al., 2016).

- **Energy Supply to the Brain**

There is a high demand for glucose in the brain, and eating provides the required energy and nutrients for proper functioning of the brain. Breakfast, after the period of food deprivation overnight, presents the possibility to increase energy and nutrient intake before school activities commence. But explanations of the role of breakfast in providing "energy to the brain glucose deprived during the night" need to be formulated with care (Adolphus et al., 2016).

- **Behavioural and Emotional Benefits**

Another factor that could contribute to behaviour is the consumption of breakfast by the students. Being hungry at school may affect how easy it is for some students to feel comfortable in class. Studies of the scientific literature have found many studies supporting the positive effect of breakfast on on-task classroom behaviour, although the level of the evidence is different depending on the population and design of the study (Adolphus et al., 2013).

Another aspect that could affect the well-being of the children was the consumption of breakfast. Lien (2007) found that young people who ate breakfast rarely or never experienced more mental distress and poorer academic performance than students who ate breakfast regularly. However, the above statements are associations and not evidence that breakfast protects against anxiety and depression.

Physical Health and Nutritional Benefits

- **Improved Nutrient Intake**

Breakfast is a significant source of daily vitamins, minerals, protein, carbohydrates, fiber, and other components of healthy diet. It is known that children and teenagers who eat breakfast have significantly higher nutrient intakes compared to those who do not eat breakfast on a regular basis (Adolphus et al., 2016). Adolescents require large amounts of various nutrients because of their physical development and need of more calories.

- **Healthy Weight and Dietary Habits**

The connection between breakfast and body weight is controversial. There are many studies which indicate that eating breakfast regularly has a connection with a healthier body weight status and healthy eating habits. Breakfast is not supposed to be considered a way of being protected from

becoming overweight or obese. Other factors such as physical activity, food intake, and socioeconomic differences might affect the results of the research (Adolphus et al., 2016).

- **Long-term Health**

The regular intake of breakfasts has been studied in relation to various health outcomes such as the quality of diet and cardiometabolic risk factors. The systematic review of studies involving children and adolescents found mostly positive relations between breakfast intake and certain health outcomes; however, the authors also noted the limitations of the existing evidence base (Lundqvist et al., 2019). Thus, the health effects of breakfasts can be viewed as possible associations rather than definite effects.

Breakfast and Academic Performance

The achievement in academics is a very significant outcome while evaluating the effects of having breakfast for the students. Several observational studies have shown that eating breakfast is linked with improved academic performance at school. For instance, Lien (2007) has found an association between skipping breakfast and poor school grades among the adolescents in Norway. Studies conducted on Korean adolescents have also found poor grades in several academic courses among the adolescents who skipped breakfast (Kim et al., 2016).

Reviewing the literature on the role of breakfast in classroom behavior and academic performance, there is evidence to suggest that habitual breakfast and school breakfast program may improve the academic performance. This has been found to be more true in case of certain subjects like math and arithmetic among nutritionally disadvantaged children (Adolphus et al., 2013).

But one should not assume that having breakfast means better performance in examinations. In an Australian study conducted longitudinally, children who did not have breakfast tended to get worse evaluations from teachers regarding academic achievement; however, objective differences in academic scores were rather minor. It is clear that confounding factors must be taken into account when discussing the influence of breakfast on educational outcomes (Smith et al., 2019).

In this sense, having breakfast contributes to the creation of conditions necessary for learning, but academic achievements depend on numerous factors that interact with each other. Therefore, a good breakfast should be seen as just one part of students' wellbeing.

Consequences of Skipping Breakfast

There are several potential impacts of missing out on breakfast. In the short-term, students are likely to feel hungry, drowsy, lack of alertness or concentration. Evidence from experiments shows that fasting has a negative impact on some indices of cognition, but the strength of the influence differs across studies and subjects (Adolphus et al., 2016).

Missing out on breakfast regularly has also been associated with poor nutrition and deficiency in some nutrients (Adolphus et al., 2016). There are studies that have found correlations between skipping breakfast and poor academic performance (Lien, 2007; Kim et al., 2016). However, these correlations should not be taken as evidence of the fact that missing out on breakfast is the only reason for poor academic performance.

Those students who tend to skip their breakfast can also manage to compensate this by having snacks throughout the day or opting for unhealthy food. All of this happens on a case-by-case basis, depending on how a person eats and what kind of food he/she has access to. Hence, the overall nutritional value of one's daily food is more important.

Characteristics of a Healthy Student Breakfast

A balanced breakfast should contain a combination of nutrient-rich foods rather than relying heavily on refined carbohydrates or foods high in added sugar.

- **Whole Grains and Complex Carbohydrates**

Whole grains such as oats, whole-wheat bread, millet, and whole-grain cereals provide carbohydrates and dietary fibre. Indian foods such as chapati, vegetable poha, and some preparations of upma can also form part of a balanced breakfast when combined with protein-rich foods.

- **Protein-Rich Foods**

Protein can contribute to satiety and supports growth and tissue maintenance. Suitable breakfast sources include eggs, milk, yoghurt, pulses, legumes, sprouts, nuts, seeds, and gram flour.

- **Fruits and Vegetables**

Fruits and vegetables provide vitamins, minerals, fibre, and various bioactive compounds. Seasonal foods such as bananas, guava, papaya, apples, tomatoes, spinach, carrots, and other locally available vegetables can be incorporated into breakfast.

- **Healthy Fats**

Nuts, seeds, and foods containing unsaturated fats can be included in moderate quantities as part of a balanced meal. Walnuts, flaxseeds, peanuts, and other nuts or seeds can provide unsaturated fats and additional nutrients.

Quick and Nutritious Indian Breakfast Options

Students having hectic academic work in schools or colleges might want meals which do not take much time for preparation. They can be like:

- **Poha**

Poha can be made from flat rice, vegetables, peanuts, curry leaves, and spices. Peanuts or any other source of protein might make the meal complete.

- **Besan/Moong-Dal Chilla**

The chillas made from besan or soaked and ground moong dal will have proteins and carbohydrates. Vegetables like onion, tomatoes, spinach, and coriander can be added for variation.

- **Vegetable Oats**

Oats can be boiled in the mixture of vegetables like carrots, peas, tomatoes, and onions. Carbohydrates and fiber can be taken easily from these.

- **Ragi Porridge**

Porridge made of Ragi/Finger Millet and milk/food of choice is another food which gives carbohydrates, fibers and minerals. In addition, it can be combined with nuts and seeds.

- **Egg Recipes**

Egg Bhurji or egg vegetable omelette can offer high quality proteins. Eggs can be combined with toast made from whole wheat or other sources of complex carbohydrates.

- **Sprouts Salad**

Salad prepared with sprouts, cucumber, tomato, onion and lemon can be a good choice. Proper food safety procedures must be maintained while handling the sprouts.

- **Peanut Butter Toast with Banana**

Toast made with whole wheat with peanut butter and banana offers carbohydrates, proteins and fats. The amount of food offered should depend on the energy needs of the child.

- **Fruit with Yoghurt**

Plain Yoghurt combined with fruit can offer proteins and calcium as well as vitamins and fiber. Less sweetened or unsweetened preparations are better than heavily sweetened versions.

- **Sattu Drink**

Sattu, which is normally taken in Bihar and some other states in India, can be made into a paste using water and adding ingredients that suit it like lemon or jaggery. Sattu can be added to meals such as breakfast especially if it is combined with another nutritious food.

Practical Strategies for Busy Students

Students may miss out on breakfast due to lack of time in the mornings. Some simple measures can be adopted to tackle this situation.

In the first place, the materials that can be used for preparing the breakfast can be done the night before. The vegetables can be washed and cut, and the ingredients for preparing chilla and dosa can be arranged. Secondly, boiled eggs and other sources of proteins which are ready to eat can be made available where required. Thirdly, fruits and nuts can offer easy choices when not much time is available for cooking food.

The most vital point to remember is the importance of balance. It will be more useful from a nutritional point of view if the breakfast contains a carbohydrate component along with protein and fibre instead of having mainly sugary items. For instance, poha can be eaten along with peanuts and yoghurt, and chilla can be had with yoghurt and vegetables.

Similarly, the amount of the food taken for breakfast should depend upon the age, activity level, appetite and dietary needs of the student.

Conclusion

Breakfast is one factor that could help students get their nutrition and prepare themselves for learning. The evidence suggests that having breakfast could have a short-term effect on certain cognitive processes such as attention, memory, and executive functioning but the findings are inconsistent across research studies (Adolphus et al., 2016). Having breakfast regularly is also linked to better nutrient intake and several positive results at school (Adolphus et al., 2013; Lundqvist et al., 2019).

However, having breakfast alone cannot determine academic success. There are many factors that influence the performance of students such as the quality of education, sleep, socioeconomic status, mental health, physical activity, support from families, diet. Some research has even found that the connection between breakfast and academic performance is less noticeable when other factors are controlled (Smith et al., 2019).

Because of this, schools, families, and pupils should concentrate more on how to make it easy to get nutritious foods for breakfast rather than just telling people to have breakfast irrespective of its nutritional value. Indian foods that can be consumed affordably by pupils include Poha, Chilla, Oats, Ragi, Eggs, Fruits, Yoghurt, Sprouts and Sattu. A nutritious breakfast combined with proper diet and a lifestyle will create good circumstances for health and learning.

Authors' Contribution

The author contributed to the conceptualization, literature review, writing, editing, and final revision of the manuscript.

Funding

This research received no external funding.

Data Availability Statement

Data availability is not applicable because this article is based on previously published literature and does not report a new dataset.

Conflict of Interest

The author declares no conflict of interest.

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