

# Breakfast and Academic Performance among College and University Students: Review of the Available Literature

Quratulain Javaid

Senior Lecturer, Anatomy Department,  
Bahria University Medical and Dental  
College, Pakistan

## ABSTRACT

Breakfast is one of the three essential meals consumed in a day. The nutrition provided by the breakfast is considered as a building block in maintenance of the functional activity of the body and henceforth is linked to the quality of life of an individual. The nutrients in the breakfast are sources of energy supply and maintains alertness, concentration and cognition. Among the students, regular intake of breakfast is associated with increased level of subject comprehension, regular attendance and increase ability to solve complicated tasks. Breakfast skipping is associated with lack of energy, disturbances in cognitive functions, mood changes, problems to retain memory and low academic scores. With higher level of education, workload rises and the demand of nutrition increases. The college and university level students are required to include healthy diet plan and should start their day with healthy breakfast. The aim of this review article is to ascertain the importance of habitual breakfast intake and its linkage to the academic performance of the college and university students. Research articles were analysed by the help of three databases; Google Scholar, PUBMED and APA database from 2005 to 2020. There is relationship of breakfast intake and educational performance of the individuals. Those who are habitual breakfast consumers have better academic achievement as compared to those who skip breakfast.

**Keywords:** Breakfast, students, academic performance, college, university

Available Online: 30<sup>th</sup> June 2020

Received: 12.03.20  
Accepted: 03.04.20

\*Corresponding Author

**Dr. Quratulain Javaid**  
Bahria University Medical and Dental  
College, Anatomy Department, 1<sup>st</sup> floor  
(Sailor Street, Adjacent PNS-SHIFA D.H.A.  
Phase 2 Karachi  
Email: docannie2010@gmail.com

**Copyright:** © the author(s). IABCR is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.




This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial

## INTRODUCTION

Diet has profound impact on the health of human beings. Our body's physical and psychological wellbeing is dependent on the food intake. It is scientifically proven in the researches that the nutrients present in the meals give strength to the body and affect life style.<sup>1</sup> Out of the three meals, breakfast is considered to be of vital importance and is considered to be affecting the health of individuals.<sup>2,3</sup> It is the very first meal that a person takes. A meal is considered to be breakfast if it is taken within two to three hours of waking up. It breaks the fast after period of prolonged sleep and can have food or

beverage from any food groups.<sup>4</sup> The nutritional status and the energy level depends on the diet that is consumed in breakfast.<sup>5</sup> In a healthy person, most of the daily energy requirement of the body comes from breakfast and it contains 20-22% of the total dietary intake a person requires. Adolescents and adults' breakfast contribute 20% of the total diet, while in the children the percentage is 22%.<sup>6,7</sup> The importance of this meal lies in the fact that the energy requirement at the start of the day are much higher than any other time period. The time lapse between the dinner meal

| Access this article online      |  |
|---------------------------------|--|
| Website:<br>www.iabcr.org       | Quick Response code<br> |
| DOI: 10.21276/iabcr.2020.6.2.01 |  |

**How to cite this article:** Javaid Q. Breakfast and Academic Performance among College and University Students: Review of the Available Literature. Int Arch BioMed Clin Res. 2020;6(2):AN1-AN6.

**Source of Support:** Nil, **Conflict of Interest:** None

and the person awake time in the morning is about ten to twelve hours.<sup>8</sup> The meal that is taken between 6 am to 11 am in the morning is considered to be labelled as breakfast.<sup>6</sup> During this time period, glucose level in the body drops and hence it is related to weak brain function. The desired amount of glucose is necessary for the proper functioning of the neurotransmitters present in the brain.<sup>8</sup> Insufficient glucose level leads to impaired cognition. Other than the glucose, iron content of the breakfast also plays a role in the emotional and physical wellbeing of the person. Breakfast provides energy to whole body and most importantly brain. Research has shown that breakfast that includes macro and micronutrients provides energy that cannot be compensated by having other meals throughout the day.<sup>9</sup> A study conducted on the people living in United Kingdom has documented the ideal food groups to be included in a healthy breakfast. The food groups are considered to be excellent sources of nutrition as they have the ability to provide energy source that helps an individual during the day. The macronutrients include, sugar, carbohydrate, protein, fat and fibre. The micronutrients include vitamin B1, vitamin C, D, E, riboflavin, niacin, B6, cobalamin, calcium, zinc, phosphorus, magnesium, iodine and iron. According to National Diet and Nutritional Survey, high fibre cereals are the ones which contain greater than 4gm/100 gm of non-starch polysaccharide. Other than these cereals all other types of cereals contain lesser than 4gm/100 gm of non-starch polysaccharide.<sup>6</sup> Habitual breakfast eating is associated with increase metabolism and as a result a person feels satisfied and can concentrate on the given tasks. Our bodies are dependent on this meal after being in starvation mode since night. Once it is skipped, the energy loss cannot be replenished. The calories present in the breakfast are a source of physical boost as well as emotional stability. The researches have proven that breakfast play a vital role in maintaining physical and emotional wellbeing, combatting stress, improved learning and cognition.<sup>10</sup> It has been documented that breakfast consumption on regular basis is associated with decrease drugs addiction, criminal behaviour, excellence in intrapersonal skills, logical reasoning and career development.<sup>11</sup> The physiological process involved that leads to effective cognition is related to the amount of glucose that reaches the brain circulation. The brain cells do not store glucose and that is why they are dependent on the amount taken in the breakfast meal.<sup>12</sup> Researches have documented that most of the individuals either skip breakfast or consume food that is unhealthy. It is documented that breakfast is essential for all the age groups, be them, children, adolescents or elderly. The parental dietary habits affects children. Those parents who consume a healthy meal plan often raise children who are in habit of having breakfast as a prime meal of the day.<sup>8</sup>

A research conducted on American white and black girls have demonstrated that with the increasing age, the habit of diet decreases. Among the girls who were 9 years old, the breakfast intake was 77% and 57% among the whites and blacks respectively. In the age group of 19 years, routine breakfast intake was 32% and 22% respectively.<sup>13</sup> The persons who skip breakfast have insufficient intake of the required carbohydrates, proteins and the fat. Researches have proven that skipping of breakfast is associated with mood alterations, mental distress, lack of concentration in the classrooms, inability to do problem solving task, fatigue and laziness.<sup>14</sup> The frequency as well as the quality of breakfast affects the academic performance of the students.<sup>15</sup>

Literature search has documented that various types of questions were designed in the studies to label regular breakfast eaters and skippers. Some of the studies have incorporated two domain breakfast classification; often (more than 5 days in a week) and never (less than five days in a week).<sup>16,17</sup> Another research that was conducted in Turkey, classified the breakfast into two categories, regular and not regular.<sup>18</sup> In a research article, three domain breakfast consumption classification was used which includes always (5-7 days in a week), often (2-4 days in a week and never (0-1 day in a week).<sup>19</sup> A research conducted in Saudi Arabia, used a five domain classification which had the following options; never, 1-2 days/week, 3-4 days /week, 5-6 days /week, every day.<sup>20</sup> Similar classification was used in a study conducted on the university students in south east United States.<sup>21</sup> Seven days breakfast classification (days of intake 1,2,3,4,5,6,7) was used by two authors.<sup>22,23</sup>

The detrimental effect of skipping breakfast can also affect negatively on the academic scores of an individual.<sup>14</sup> A recent study conducted in China has mentioned that regular breakfast intake is associated with better academic performance both among the medical and dental students.<sup>24</sup> There are numerous studies which are conducted on the school children documenting the association of breakfast intake with that of the academic performance.<sup>25,26</sup> Very few studies have been conducted on the college and university students. The aim of the current research is to ascertain the linkage of breakfast consumption and its effect on the academic performance of the students of colleges and universities.

#### **Breakfast and academic performance**

It is evident from the studies that the habitual intake of healthy breakfast is associated with improved learning, cognition, and high attention span of the students. These factors have a positive effect on the academic performance of the students. The academic grades are correlated with the regular intake of breakfast meal.<sup>27</sup> One of the reasons behind the good academic scores is that those who take breakfast on regular basis attend the educational institutes more regularly and they can concentrate in the sessions more than that of those who skip breakfast.<sup>28</sup> A study conducted on the medical students of Ghana have documented that breakfast skippers tend to have tiredness and lack of energy in the morning sessions.<sup>7,14</sup> Similar findings were noted in a randomised controlled trial on the female study subjects documenting that regular intake of breakfast promotes feeling of relaxation.<sup>29</sup> A study conducted on the students of Udupi district have documented that regular intake of breakfast is correlated with the retention of what a person learns. This helps in recall of what has been stored in the memory.<sup>25</sup> A research on girls of Junior High School have reported that Intake of healthy breakfast on regular basis is associated with high academic performance as demonstrated by a study conducted on the Health Sciences students of Malaysia.<sup>30</sup> A large scale survey conducted in Jiangsu province has documented that among the students of primary school, those who have regular intake of breakfast had scored 31.322 points more than who skipped breakfast. In comparison to that, the middle school breakfast eaters scored 31.335 more than that of the skippers. It was concluded that breakfast has positive effect on the cognition of students.<sup>31</sup> The students who are in habit of having daily breakfast are shown to be able to concentrate in class and have good memory store ( $p=0.05$ ). Other than that they are

able to comprehend and solve difficult tasks with ease. These factors play a positive role in the academic performance of the students ( $p=0.001$ ).<sup>20</sup> A study by Lovino, has demonstrated that intake of breakfast does not affect the neuropsychological function of the brain.<sup>32</sup>

### Reasons behind individuals having regular intake of breakfast

A research article published in 'North African Journal of Food and Nutrition', has published that 60% of those who consume breakfast believe that it is important for them and 25% feel good after having the very first meal of the day.<sup>20</sup> A study published in 'public Health nutrition' has demonstrated that habitual breakfast eating is related to emotional wellbeing.<sup>33</sup> According to a study, individuals who regularly ate breakfast demonstrated to have high quality of life and low stress.<sup>34</sup>

### Breakfast skippers

Many adults skip this important meal as they have a wrong conception that breakfast can help decrease weight.<sup>8,25</sup> Emotional and psychological wellbeing is dependent on regular intake of breakfast. It is an important factor which is essential for scoring good academic scores.<sup>35</sup> A study conducted on the medical students of Tabuk, Saudi Arabia has documented that the dietary intake of breakfast among the medical students was observed to be unhealthy and the breakfast skippers were 42%.<sup>36</sup> A study conducted on the medical students of Ghana has reported that 71.92% of the students skip breakfast.<sup>7</sup> A study conducted on the medical students of Bangladesh has documented breakfast to be the only meal that is most commonly skipped among the three meals. Out of 349 participants, 230 students were observed to skip breakfast; the skipping of breakfast in males and females was 44.85 and 55.2% respectively. A cross sectional survey on the importance of breakfast and academic performance has reported that out of those who skip breakfast, 40% eat after two morning sessions and 60% directly eat lunch.<sup>37</sup> A study has mentioned that lack of breakfast intake in the morning can lead to laziness and tiredness.<sup>38</sup>

### Reasons for skipping breakfast

A study published in the 'Journal of Psychophysiology' has documented the effect of breakfast intake and 12 hours fasting on the electrical brain activity. It was observed that skipping of breakfast is associated with disturbance in assessment of stimulus, memory decoding process and apportionment of attention.<sup>39</sup> A study conducted on the nursing students has reported that most of the participants were breakfast skippers and most of them were females.<sup>40</sup> A study conducted on Indian subjects have documented that breakfast skipping has become common due to the change in lifestyles adopted by people these days.<sup>41</sup> The main reason as mentioned in the literature are time constraint, lack of food supply in the hostels, habitual skipping, reduced appetite and lack of resources. Sleep quality is also linked to skipping of breakfast.<sup>42</sup> Class attendance is also affected by the skipping of this vital meal. A study has revealed that family environment also play a role in habitual breakfast skipping. Children who are raised by single parents tend not to have a habit of having breakfast.<sup>43</sup> A study conducted on the students of Penang International Dental College has reported that breakfast skippers were aware of the importance of breakfast, but still there life style does not allow them to have it.<sup>44</sup> A study conducted on adolescents has documented that as the adolescents grow, they are more concerned about their looks. They skip breakfast assuming

that it can help them reduce weight and keep them in good body shape.<sup>25</sup> A study has mentioned that breakfast skippers are more hostilities as compared to the day scholars.<sup>45</sup> A research conducted on the Saudi adolescents have documented that 39% of the students are in habit of skipping breakfast. Parental influence does play a role in how the off springs consume and maintain diet. The school children follow the trends set by their parents and as an adolescent and adult they follow the same routine and practices. The parents who are working do not have enough time to make sure that their children do breakfast on regular basis.<sup>20</sup>

## METHODS

Review of the articles in which impact of breakfast on academic achievement of college and university students was done using Google Scholar, PubMed and APA database. The articles were searched in between 2005 until 2020. Eleven articles met the inclusion criteria and were included in the research.

### Inclusion criteria of the articles

Articles written in English

Articles were included in which association of breakfast on academic performance was observed

College or university students

### Exclusion criteria of the articles

Articles in languages other than English

Articles in which lunch and dinner associations on academics were noted

School children

Adolescents

## RESULTS

### Frequency of breakfast intake

World over, the research articles on breakfast and their association with academic performance study have documented variable pattern in terms of classification of frequency of breakfast intake as well as academic performance evaluation. In the present research, to ascertain the intake or skipping of breakfast, articles used two and three domain classification. Two domain classification was used by Phillips<sup>27</sup>, Devi<sup>41</sup>, Haldar<sup>3</sup>, Sofar<sup>40</sup>, Fatima<sup>14</sup>, Chawla<sup>44</sup>. In the current research, three-domain classification was used by Arshad<sup>38</sup>, Unal<sup>2</sup>, Rehman<sup>35</sup>, Javaid<sup>37</sup>. (Table 1)

### Assessment of academic performance

Javaid<sup>37</sup>, Rehman<sup>35</sup>, Haldar<sup>3</sup> and Khurshid<sup>45</sup> assessed the academic performance on the basis of accumulative scores. Grading system as a mode of assessing academic performance was used by Philips<sup>27</sup> and Sofar<sup>40</sup>. The studies conducted by Unal<sup>2</sup> and Chawla<sup>44</sup> judged the performance of the students according to CGPA. (Table 1)

### Regular breakfast consumers vs skippers

The highest breakfast consumption in percentage was reported by Khurshid<sup>45</sup>. Chawla<sup>44</sup>, Unal<sup>2</sup>, Philips<sup>27</sup> reported percentages of breakfast consumption to be closer. Highest skipping percentage was mentioned by Sofar<sup>40</sup>. Various reasons were mentioned for breakfast skipping and among them lack of time was the most common reason quoted by Sofar<sup>40</sup>, Unal<sup>2</sup>, Arshad<sup>38</sup>, Khurshid<sup>45</sup> and Devi<sup>41</sup>. In the studies conducted by Javaid<sup>37</sup>, Arshad<sup>38</sup>, Fatima<sup>14</sup>, Rehman<sup>35</sup>, Haldar<sup>3</sup> and Philips<sup>27</sup> reasons behind skipping breakfast were not mentioned. (Table 1)

Table 1: Comparison to evaluate effect of breakfast on academics of college and university students

| First author           | Research conducted in   | Breakfast intake question  | Percentage who ate/skip breakfast   | Reason for skipping meals  | Academic performance tested by  | Conclusion  |
|------------------------|---|--|---|--|---|---|
| Philips <sup>27</sup>  | Blinn College, Texas  | Did you eat breakfast this morning?<br>1. Yes<br>2. No   | 65.6% had breakfast   | Not mentioned  | Biology exam result. 72.7% students pass the exam with grades C or better and had breakfast. 50.8% students pass the exam with grades C or better and had no breakfast.                                       | The participants who had breakfast intake showed to have better scores in Biology exam result   |
| Unal <sup>2</sup>      | A state university in Turkey                                    | Breakfast<br>1. Daily<br>2. Sometimes<br>3. Never  | 67.7% had regular intake of breakfast   | 1. Lack of time (29.3%)<br>2. Poor appetite (21.9%)<br>3. Not To Be Late (12.1%)<br>4. Absence Of Someone Preparing Food (7.1%)<br>5. Weight Loss (1.4%)<br>6. Lack Of Habit (11.8%)   | Those who had daily, sometimes and never breakfast had GPA of 3.17±0.37, 2.82±0.41, 2.46±0.49 respectively  | Regular intake of breakfast is related to high GPA scores and hence success in academics  |
| Haldar <sup>3</sup>    | Manipal College of Nursing, Karnataka, India                    | Do you eat breakfast regularly?<br>1. Yes<br>2. No   | 40.7% skipped breakfast   | Not mentioned  | 99.1% scored good in Immediate visual test and 94.9% in focus test. Breakfast intake and effect on academic scores (p=0.595)  | There is no association of breakfast intake and academic performance  |
| Rehman <sup>35</sup>   | Bahria University, Pakistan                                     | How often do you eat breakfast?<br>1. Rarely or never<br>2. Sometimes<br>3. Everyday   | 17.5% skipped breakfast   | Not mentioned  | Significant association of breakfast intake and academic performance was noted, (p=0.04). From those who skipped breakfast, only 24.6% could score good.  | Breakfast intake is associated with high academic performance   |
| Sofar <sup>40</sup>    | Faculty of Nursing, Alexandria University, Egypt                | Skipping of breakfast<br>1. Skip (>4 times in a week)<br>2. Not skip (<4 times in a week)  | 87.6% skipped and 12.4% did not skip breakfast  | 1. Have no time (67%)<br>2. Not hungry (41.8%)<br>3. Fear of increase weight (17%)<br>4. Don't like breakfast food (15.4%)<br>5. Students family skip breakfast (14.1%)<br>6. Students friends skip breakfast (5.2%)<br>7. Breakfast not available (6.5%)<br>8. Lack of appetite (20.3%) | 2/3 of those who did not skip breakfast scored A grade and C grades were scored by those who skipped breakfast  | Majority of the students were skipping breakfast and it was associated with low educational performance   |
| Devi <sup>41</sup>     | MM College of Nursing, Mullana, India                           | Breakfast<br>1. Skippers<br>2. Non-skippers  | Breakfast skipping and non-skipping were seen in 70.8% (51/72) and 29.2% (21/72) respectively   | 1. Lack of time 29/51<br>2. Laziness 3/51<br>3. Fullness 15/51<br>4. Tasteless food 4/51<br>5. Other 3/51  | Breakfast intake and its association with good academic performance was significant (p=0.05)  | Breakfast affects academic scores.  |
| Fatima <sup>14</sup>   | University of Lahore, Pakistan                                  | Breakfast<br>1. Do take breakfast<br>2. Do not take breakfast  | 48.1% and 51.9% had breakfast and skipped breakfast respectively  | Not mentioned  | Significant relationship between breakfast skipping and failure in exam   | There was no association between breakfast and professional year marks. There was significant relation between skipping and failure in final exams. |
| Chawla <sup>44</sup>   | Penang International Dental College, Malaysia                   | Skipping breakfast<br>1. Yes<br>2. No  | 38% skipped and 62% did not skip breakfast  | 1.Lack of time-80%<br>2.Appetite (9%)<br>3.Financial Problem (91%)<br>4.Other reasons (10%)  | The participants were tested for English language proficiency by focus test and memory. Highest CGPA of 8-10 was scored by non-breakfast skippers. CGPA of 6-6.99 was scored mostly by the breakfast skippers | Breakfast is related to better CGPA   |
| Arshad <sup>38</sup>   | University of Sargodha, Pakistan                                | Meal skipping<br>1. Never<br>2. Sometimes<br>3. Often  | 47% of the students skipped breakfast out of the three meals  | Not mentioned  | Students who skipped breakfast had low problem-solving capacity (p=0.000)   | There was association observed between breakfast consumption and academic performance   |
| Javaid <sup>37</sup>   | Princess Nourah Bint Abdulrahman Women University, Saudi Arabia | Breakfast skipping<br>1. Sometime<br>2. Often<br>3. Always   | The participants were divided into two groups. Those who eat breakfast frequently were labelled as regular breakfast eaters (70%). Those who skip occasionally or always were labelled as breakfast skippers (30%). | Not mentioned  | Academic performance score was 91.76±11.61 in those who eat breakfast and 51.00±17.14 in those who skip breakfast   | Breakfast intake has influence on the academic performance of the students  |
| Khurshid <sup>45</sup> | Local college of Lahore, Pakistan                               | Those who eat breakfast on 4 days/week or more were regarded as breakfast eaters. Those who skip breakfast for 4 days/week were labelled as breakfast skippers | 70% ate breakfast regularly. 30% were breakfast skippers  | 1.Food is not delicious - 80% agreed<br>2.Quantity is small - 40% agreed<br>3.Not cooked well- 35% agreed<br>4.Getting late - 60% agreed<br>5.Late night food - 50% agreed<br>6.Food is finished - 50% agreed  | Academic performance score was 81.67±10.54 in those who eat breakfast and 57.2±15.24 in those who skip breakfast. Significant association between breakfast and academic performance was found (p=0.001)      | Breakfast intake was positively correlated with the academic performance  |

## DISCUSSION

The literature search on the effect of breakfast on academic performance has documented the positive effect of breakfast intake on the college and university student's world over. Various contributing factors play a positive role in individuals developing the habit of regular breakfast intake. It has been documented that the college and university students have a hectic schedule. They are time bound and report to their respective institutions without having morning meal. Skipping of breakfast can have detrimental effects on the body. Those who have regular intake of breakfast are shown to be achievers in their respective fields. The nutrients and the energy contained in the breakfast meal make the individuals energetic, attentive and active learners. The academic performance evaluation is a subjective criterion. All the research articles that were included in the study evaluated academic achievements on the basis of different criteria. There is a need to standardize the methods on which academic performance is scored or evaluated so that comparison among the articles can be based with validity. Since breakfast play a crucial role in growth of the youngsters, it is important to do awareness campaigns, highlighting the importance of breakfast. There is a need to do future studies on the role of breakfast intake on academic achievements of college and university students.

## CONCLUSION

The researches that have been conducted world over have demonstrated that breakfast plays an essential role in providing nutrition that is the basis for sustaining the physical and social wellbeing of an individual. The practice of breakfast intake on daily basis affect the level of cognition. The college and university students who are habitual breakfast eaters show high level of alertness, presence of mind, excellence in problem solving skills along with good control of behaviour and take interest in the classroom sessions. All these factors play a significant role in attaining high academic scores.

## REFERENCES

- Taha Z, Rashed AS. The effect of breakfast on academic performance among high school students in Abu Dhabi. *AJNE* 2017;16:40-9.
- Unal G, Uzdil Z, Kokdener M, Ozenoglu A. Breakfast habits and diet quality among university students and its effect on anthropometric measurements and academic success. *Prog. Nutr* 2017;1(19):154-62.
- Haldar P, Nayak BS, Satish Y. Factors of skipping breakfast and association between skipping breakfast and academic achievement of nursing students. *Indian J. Public Health Dev* 2018;9(6):118-24.
- O'Neil, C. E., Byrd-Bredbenner, C., Hayes, D., Jana, L., Klinger, S. E., & Stephenson-Martin, S. The role of breakfast in health: Definition and criteria for a quality breakfast. *JAND* 2014;114(12):8-26. <https://doi.org/10.1016/j.jand.2014.08.022>
- Wijtzes Al, Jansen W, Jaddoe VW, Franco OH, Hofman A, van Lenthe FJ, Raat H. Social inequalities in young Children's meal skipping behaviors: the generation R study. *PLoS one*. 2015;10(7) e0134487. doi:10.1371/journal.pone.0134487
- Gaal S, Kerr MA, Ward M, McNulty H, Livingstone MB. Breakfast Consumption in the UK: Patterns, Nutrient Intake and Diet Quality. A Study from the International Breakfast Research Initiative Group. *Nutrients* 2018;10:999-1019 doi:10.3390/nu10080999 [www.mdpi.com/journal/nutrients](http://www.mdpi.com/journal/nutrients)
- Ackuaku-Dogbe EM, Abaidoo B. Breakfast eating habits among medical students. *Ghana Med J* 2014;48(2):66-70.
- Affinita A., Catalani, L., Cecchetto, G. et al. Breakfast: a multidisciplinary approach. *Ital J Pediatr* 2013;39:44. <https://doi.org/10.1186/1824-7288-39-44>
- Jeyakumar A, Ghugre P. Is lack of breakfast contributing to nutrient deficits and poor nutritional indicators among adolescent girls? *Nutrition and health* 2017;23(3):177-84.
- Williams P. The Benefits of Breakfast Cereal Consumption: Systematic Review of the Evidence Base. *Advances in Nutrition* 2014;5(5):636-75 <https://doi.org/10.3945/an.114.006247>
- Benton D, Maconie A, Williams C. The influence of the glycaemic load of breakfast on the behaviour of children in school. *Physiology & behavior* 2007;92(4):717-24.
- Wakabayashi KT, Myal SE, Kiyatkin E A. Fluctuations in nucleus accumbens extracellular glutamate and glucose during motivated neuro-drinking behavior: Dissecting the neurochemistry of reward. *J. Neurochem* 2015;132(3):327-341. <https://doi.org/10.1111/jnc.12993>
- Basch CE. Breakfast and the achievement gap among urban minority youth. *JOSH* 2011;81(10):635-40.
- Fatima M, Waqas M, Tariq U, Sarwar R, Ahmad S, Faizan M. Effect of breakfast on academic performance of medical students. *RMJ* 2019;44(3):618-21.
- Adolphus K, Lawton CL, Dye L. The effects of breakfast on behavior and academic performance in children and adolescents. *FRONT HUM NEUROSCI* 2013;8:7:425.
- Edwards JU, Mauch L, Winkelman MR. Relationship of nutrition and physical activity behaviors and fitness measures to academic performance for sixth graders in a midwest city school district. *JOSH* 2011;81(2):65-73. doi:10.1111/j.1746-1561.2010.00562.x
- Boschloo A, Ouweland C, Dekker S, Lee N, de Groot R, Krabbendam L, Jolles J. The relation between breakfast skipping and school performance in adolescents. *Mind, Brain, and Education* 2012;6(2), 81-88. doi:10.1111/j.1751-228X.2012.01138.x
- Kukululu K, Sarvan S, Muslu L, Yirmibesoglu SG. Dietary habits, economic status, academic performance and body mass index in school children: a comparative study. *J. Child Health Care* 2010;14(4), 355-366. doi:10.1177/1367493510380079
- Gajre NS, Fernandez S, Balakrishna N, Vazir S. Breakfast eating habit and its influence on attention-concentration, immediate memory and school achievement. *Indian Pediatr* 2008; 45(10), 824-828.
- Alrayes A, Alowayshiq H, Altamimi H, Alangari R, Benajiba N. Association between Breakfast Intake and Short-Term Memory, Performance and Mood among Saudi Female Adolescents. *Nor. Afr. J. Food Nutr. Res* 2018;2(4):75-80
- Wells E, Avery M, Catanzarito B, Wilson B, Bunn J. Assessment of breakfast and physical activity habits in college students at a rural private institution. *J PES* 2016;16(3):770-75
- So, W. Y. Association between frequency of breakfast consumption and academic performance in healthy Korean adolescents. *Iran J Public Health* 2013;42(1):25-32.
- Miller DP, Waldfoegel J, Han WJ. Family meals and child academic and behavioral outcomes. *Child Dev* 2012;83(6):2104-20. doi:10.1111/j.1467-8624.2012.01825.
- Hou Y, Mei G, Liu Y, Xu W. Physical Fitness with Regular Lifestyle Is Positively Related to Academic Performance among Chinese Medical and Dental Students. *BioMed Research International* 2020;1-10.
- Garg M, Rajesh V, Kumar P: Effect of breakfast skipping on Nutritional Status and School Performance of 10-16 years old children of Udipi District. *Health Popul Perspect Issues* 2014;37:98-117.
- Thivel D, Isacco L, Aucouturier J, Pereira B, Lazaar N, Ratel S, Doré E, Duché P. Bedtime and sleep timing but not sleep duration are associated with eating habits in primary school children. *J Dev Behav Pediatr* 2015;1:36(3):158-65.
- Phillips GW. Does Eating Breakfast Affect the Performance of College Students on Biology Exams?. *Bioscene: Journal of College Biology Teaching* 2005;30(4):15-9.
- Rampersaud GC, Pereira MA, Girard BL, Adams J, Metz JD. Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *J. Acad. Nutr. Diet* 2005;10(5):743-60.
- Veasey RC, Haskell-Ramsay CF, Kennedy DO, Tiplady B, Stevenson EJ. The effect of breakfast prior to morning exercise on cognitive performance, mood and appetite later in the day in habitually active women. *Nutrients* 2015;7(7):5712-32.
- Ludin AF, Lim SL. Factors affecting breakfast consumption and its association with academic performance among undergraduates. *Jurnal Inteltek*. 2016;10(2):1-6.
- Yao J, Liu Y, Zhou S. Effect of Eating Breakfast on Cognitive Development of Elementary and Middle School Students: An Empirical Study Using Large-Scale Provincial Survey Data. *Med Sci Mon Int Med J Exp Clin Res* 2019;25:8843-53.
- Iovino I, Stuff J, Liu Y, Brewton C, Dovi A, Kleinman R, Nicklas T. Breakfast consumption has no effect on neuropsychological functioning in children: a repeated-measures clinical trial. *The AJCN* 2016;104(3):715-21.
- Lien, L. Is breakfast consumption related to mental distress and academic performance in adolescents? *PHN* 2007;10(4):422-428. doi:10.1017/s1368980007258550
- Ferrer-Cascales R, Sánchez-SanSegundo M, Ruiz-Robledillo N, Albaladejo-Blázquez N, Laguna-Pérez A, Zaragoza-Martí A. Eat or skip breakfast? The important role of breakfast quality for health-related quality of life, stress and depression in Spanish adolescents. *Int. J. Environ. Res* 2018;15(8):1781.
- Rehman R, Zafar A, Mohib A, Hussain M, Ali R. Self-reported academic performance in relation to health behaviours among Bahria University students. *JPMA. The Journal of the Pakistan Medical Association*. 2018;68(2):195-99.
- Mirghani HO, Albalawi KS, Alali OY, Albalawi WM, Albalawi KM, Aljohani TR, Albalawi WS. Breakfast skipping, late dinner intake and chronotype (eveningness-morningness) among medical students in Tabuk City, Saudi Arabia. *PAMJ* 2019;5:34(178). doi:10.11604/pamj.05/12/2019.34.178.16250
- Javid A, Munir I. Breakfast Skipping and its Effects on Emotional and Academic Behaviour of a Group of Saudi Medical Students. *J Nutr Food Sci*. 2018;8(6):1-4.
- Arshad N, Ahmed U. Impact of breakfast habits on education performance of university students (A study conducted on University of Sargodha, Pakistan). *IJARPED*. 2014;3:255-70.
- González-Garrido AA, Brofman-Epelbaum JJ, Gómez-Velázquez FR, Balart-Sánchez SA, Ramos-Loyo J. Skipping Breakfast Affects the Early Steps of Cognitive Processing. *Int. J. Psychophysiol* 2018;33:109-18
- Sofar SM, Hafeez NA, Relations between Skipping Breakfast, Academic Performance and Body Mass Index among Undergraduate University Nursing Students. *JNHS*. 2019;8(4):32-42.
- Devi SS, Devi R, Bankimchandra S. An exploratory study to assess the effect of breakfast skipping on college performance among B.Sc. nursing

- students in MM College of nursing, Mullana, Ambala. IJAR 2017;3(3):904-6.
42. Thivel D, Isacco L, Aucouturier J, Pereira B, Lazaar N, Ratel S, Doré E, Duché P. Bedtime and sleep timing but not sleep duration are associated with eating habits in primary school children. JDBP 2015;1;36(3):158-65.
  43. Levin KA, Kirby J. Irregular breakfast consumption in adolescence and the family environment: Underlying causes by family structure. Appetite 2012;1;59(1):63-70.
  44. Chawla R, Emy MK, Singh MH, bin Abd Razak MA. Role Of Breakfast, BMI And English Language Proficiency On Academic Performance Of Undergraduate Dental Students: A Cross-Sectional Study. BJMHS 2019;1(3):56-68.
  45. Khurshid R, Mahmood M, Chaudhry F, Paracha HM, Maham M, Haq FH. Factors associated with skipping breakfast among Day scholars and Boarding Adolescent and their effects on their academic performance. PJMHS 2018;12(4):1706-10.

