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Nutrition and the Effects on Student Behavior and Academic Performance in the Classroom

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Abstract

Nutrition, behavior, and academic performance; these three words have a few commonalities. They each can be related to children. They each can be related to school and they each can be related to issues in education. The following research has found intriguing statistics that are useful when investigating or planning a classroom climate.

It has always been said that breakfast is the most important meal of the day. It jumpstarts the metabolism and awakens the body. Along with this it helps curb the appetite before lunch. An early addition to school nutrition was the availability of breakfast before school. This was a benefit for students because it created less of a gap for those who did not have food at home and those that did.

Behavior can be a trying issue in the classroom. Students who struggle with behavior are students who need extra help. There are many reasons that a student may struggle with negative behavior but, working 8 hours on school work on an empty stomach does not help the matters any. Hunger does not help with brain functionality or behavior. The studies cited provide evidence that while hunger and unhealthy eating habits are not the sole reason behind poor behavior and negative academic performance it does not help the matter either. Studies showed that students who were hungry or did not have adequate nutrition struggled greater at focusing and on short term recall than those students who were well nourished.

By completing a search and literature review there was an outstanding amount of data and statistics to base a sound outcome.

Keywords: Nutrition, Behavior, Performance

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Introduction

Teachers encounter many “things”. Public school teachers encounter many more “things”. While each school and school district has their own problems and obstacles that are potential dangers to the classroom culture and the teacher’s ability to be affective, public schools experience lower income and higher level of poverty. There is also a lower graduation rate along with a greater need for discipline. Part of the public school’s initiative is that there is the ability for students to have free education. This means that students are able to come to school and have the ability to have free breakfast, lunch and textbook rentals. In areas around Indiana many students take advantage of this. While, a lot of good can come from this program and students are able to get food and nutrients while at school, most students who are on free lunch do not come from homes that have nutritious foods available. The following research is searching for the links between nutrition and the behavior that result in the classroom. Finding this link could be beneficial in adjusting the way a teacher manages a classroom and interacts with students.

Behavior has an impact on learning and teaching ability in the classroom. If the class is composed of “problem” students then the teacher is unable to spend the classroom time instructing. It would be more crowd management and behavior management. By looking into what students are consuming it may lay the ground work for how or if nutrition impacts behavior and there impacts ability to focus and retain information.

It is unknown what amount of data is available along with the differences in nutrition and the behavior along with academic success. Going back to the saying, “Breakfast is the most important meal of the day.” Has this saying been proven or is there no link to nutrition and

classroom behavior? In the following research there is hope for an answer. Are there statistics that will prove one way or another that nutrition has any effect on children's behavior? There are many unknowns but starting with this there is hope that others will be discovered.

Although it is known that behavior is typically related to academic success, the connection with nutrition and how it affects behavior and academic success is still unknown. Thus, I propose to do a literature review investigating other studies on how nutrition (healthy vs unhealthy and undereating vs overeating) affects students overall behavior and their ability to retain information learned in class.

There have been many questions that have crossed my mind but I would say the questions that have stood out the most have been what type of nutritional options do children have in the public school system? How does this work for families that do not have extra income to cover the daily cost? Can nutrition affect the behavior of students at school, if so, how and in what way? How does behavior affect school functionality? How does behavior and nutrition impact a student's ability to retain information, have memory recall, and focus on the task at hand?

When researching what type of nutritional options children have in the public school system, I am expecting to find government aid, government requirements and location adjustments over time to these requirements. There will be research from the history of food and nutrition in schools. Looking into how this works for families that do not have extra income to cover the daily cost, there will also be information on this from government food and nutrition sites. Can nutrition affect the behavior of students at school, if so, how and in what way? I will look at what studies and other researchers have found and compile evidence to prove one way or the other. I believe that it does indeed have an effect on behavior. When looking as how behavior

affects school functionality, I hope to find research and statistics that provide evidence one way or the other in regards to this matter. How does behavior and nutrition impact a student's ability to retain information, have memory recall, and focus on the task at hand? There is an overwhelming amount of research on student behavior and academic success. Fumbling through all of the data, I hope to find a cohesive amount of evidence that proves the connection between behavior and academic success.

I will gather information by investigating and searching other works of published data that details information on the topics of nutrition, behavior and academic success for school age children. I am an educator and spend all day in the classroom with students who are at the low end of the economic system. There are multiple articles and journals that have reported on this information. I heavily depended on the Indiana State University Cunningham Library online search and data bank to help guide my searches the articles that were made available.

The purpose of this research is to identify the connection and issues of nutrition, student behavior in the classroom, along with academic performance and success. There are many opinions and suggestions on this topic. Coming up with a paper with this bias and majority data and fact is an important mindset when writing.

Literature Review

Nutrition and School

Children between the ages of 5 and 18 spend more than 65 percent of their time in school. This is a large chunk of time. When a school day begins at 7:30 in the morning and ends around 2:30 in the afternoon there is a lot of brain work and not as much time spent ensuring nutrition. School Breakfast has been around for many years. According to the USDA Food and Nutrition Services website The School Breakfast Program started pilot project in 1966. To get schools to

participate the government gave extra federal funding to allow for such a program. Within the first year the program reached 80,000 students costing nearly \$573,000. The next few years following there were many adjustments and extending dates but the program took off and became what it is today. Looking at a chart used in the article, School Breakfast Program: Trend and Factors Affecting Student Participation the level of participation in school breakfast was greatly impacted by whether or not the students were receiving it for free or not.

In 2004, around seven million students were participating daily in the School Breakfast Program. At this same time fewer than two million were paying full price and fewer than one million students were paying a reduced rate. When looking at the statistics for 2014 there are nearly ten million students who are receiving a free breakfast where as the number of students who participate daily and are paying a reduced or full price rate are at the same amount, below two million. This is telling of the trends that continue to stick when regarding most school fees. If it is free than the turn out or outreach will be greater than if it is made available for just a reduced price.

The National School Lunch Program (NSLP) was part of President Harry Truman's office accomplishments. In 1946, President Truman, signed the National School Lunch Act. This act's purpose is to "safeguard the health and well-being of the Nation's Children and to encourage the domestic consumption of nutritious agricultural commodities and other foods" (Ralston, 6). There has been an overwhelming amount of changes in the public school system since 1946. When President Truman signed the Act students were struggling with being underweight and not having enough to eat. The food options were healthier and more nutritious but the portions were suggested to be much smaller. Now, in 2015, food options are much worse. It is a difficult balance between healthy food options, portion sizes, and reasonable prices.

With rates like “60 percent of American children between the ages 5 and 18 years old participating in the program at least once a week, and half of those students are receiving free lunch,” it creates a financial burden in cafeterias across the United States.” (Ralston, 9) The National School Lunch Program was considered the second largest program under the U.S. food and nutrition assistance programs.

In 1946 when the program was started children were considered to be underweight due to poverty. Now, in 2015 children who come from a high poverty level are typically extremely overweight. Common reasons behind this change in weight when poverty is the same is due to the rising availability for fatty foods and “Junk Food”. The price for a McDonald’s cheeseburger, large fry, and a large coke is under \$5, whereas the cost of a home cooked meal with fresh produce and healthier meat options is significantly higher. In this era it is easier and cheaper to eat junk than it is to make healthy food choices.

This is what created a push for First Lady Michelle Obama. She worked hard with USDA and the NFL to recreate the plan that was set in place. The My Plate diagram came out along with the Fuel Up to Play60; these two changes impacted the outlook schools had on lunch options. Lunches now have a strict guideline to follow. According to the USDA School Lunch FAQs page students in high school are allowed to decline two of the five required lunch options. The school is allowed to sell items such as chips, cookies, and ice cream as long as they are extra. They are not to be considered part of the meal that the students receive. These items must be purchased and are not discounted like other lunch options (School Meals). When talking to students, they like that they have choices but they feel like the choices they can afford don’t taste as good as the items they can purchase.

Schools are also required to make special accommodations for students who have special dietary needs. This could be allergies, intolerance to gluten or any other possible situation. A student just needs to inform the school and cafeteria staff of the need and they will ensure that it is taken care of (School Meals).

It's been found that there is a consistent fine line between what is wasted and what is consumed during school meal times. This has been said can be due to too much time in the lunch room, not enough time in the lunch room, or food that lacks a desirable taste factor (Ralston). When schools begin to adjust these factors they begin to find an appropriate balance that works for teachers, administration, and the students. Some schools still have not found the "balance". Each school is uniquely different in what it needs and can do.

Nutrition and Behavior

In the classroom nearly anything can happen. In one classroom, there are different cultural backgrounds, opinions, beliefs, academic levels, and socio-economic backgrounds present. With such diversity it is crucial to implement flexibility along with guidelines. Students learn best with structure. Even with that being stated the most rehearsed and skilled teacher can still find him or herself in moments saying, "did that just happen?!" or "Well, that didn't work, maybe there is a better way to do this." Moments where no level of training can prepare educators in how to react; only experience can do that.

Some of those moments can be present when students arrive to class on a Monday morning and haven't had anything to eat since lunch the Friday before. Or when students have been raised on junk foods and have never tried fruits or vegetables before. These students; the ones that have been deprived of fresh produce and are overweight and obese, are the ones have been set up difficulty over time.

When a student is obese or overweight there may be struggles of insecurities, low self-esteem, and depression. This could result in a student's withdraw from class, inability to focus, low care factor, a high amount of truancies or tardiness, or unwillingness to socialize. In an article that Howard Taras and William Potts-Datema wrote titled, Obesity and Student Performance at School stated that, "Obesity at age 14 years was associated with a low school performance at 16 years and a low level of education persisting until at least age 31." This creates a classroom culture and a lifestyle that does not cultivate learning or positive peer socializing; both of which are crucial fundamental aspects of learning.

Malnourishment also has negative affects to classroom culture and the ability to learn. If a student is concerned about where dinner will come from the ability to focus on vocab terms or math formulas become less important. When school related tasks become less important and students are battling hunger, student's ability to relate and cope through class without causing disruptions lower. In most classroom settings students who are dealing with issues of hunger within the home typically act out in hopes of gaining attention or even due to irritation and grumpiness resulting from the extreme hunger. When students are battling these issues teachers find it difficult to cultivate a culture for teaching until the students have been properly nourished.

According to Howard Taras in the article Nutrition and Student Performance at School, there was a study done to test how vitamins might affect a child's IQ. In this study:

"26 delinquent children from a psychiatrically oriented facility were given either a placebo or nutrition supplements (consisting of all vitamins and 11 minerals) for 13 weeks. Measures included a nutritional assessment (7-day food record), blood analysis of vitamin concentrations, intelligence testing (WISC-R), and brain electrical activity mapping (computerized electroencephalogram/ electroencephalogram). Pre-intervention

showed no differences in IQ scores of placebo and treatments groups (IQ 100). At the end of the 13- week trial, placebo group (11 children) remained the same and the supplement group (15 children) IQ rose to 107. Gains in excess of normal test-retest variation (8 points) were limited to 6 children.”

This test proved evidence that vitamins and minerals are important nutrients to the developing brain. The brain is constantly developing and retaining knowledge; especially during the school age years.

When looking at students who eat breakfast there was a study completed noted by Taras:

“97 undernourished (low weight for age) and 100 adequately nourished children (third and fourth grades) were given either a full breakfast or a quarter of an orange. A battery of 4 cognitive tests was given. After a few weeks, the treatments were reversed and tests repeated. Undernourished children’s performance improved significantly on a test of verbal fluency when they received breakfast. Adequately nourished children did not change. Other test scores did not change as a result of breakfast.” (Taras, 11)

There were many tests referenced in Taras’ article. While, they each consistently supported that children did not gain intelligence by eating breakfast, there was evidence that attention and memory abilities improved. Students who were given breakfast and then asked to complete an activity that required attention were much more successful than those students who did not receive nutrients prior to completing the tasks (Taras, 14). When looking at attendance, the tardy and truancy rate went down for schools that had high functioning breakfast programs. This could also be assumed to be linked to a schools level of test scores. Studies neither support nor reject this theory. While students who eat breakfast and lunch do better at paying attention

and short-term memory that is also argued to be because they are not hungry; not because the nutrients make them more intelligent.

School and Behavior

If a public school educator were to be asked what the most difficult part of his or her job is it would be discipline. Poor behavior in the class room is devastating to the learning environment. Public school verses private schools have night and day differences. What one school struggles with another school may not encounter. Behavior could be related to many factors; upbringing, culture, parents, society, goals, outlook, and ability level. Nutrition falls in part of the parents or upbringing factors. Many children who suffer from obesity or undernourished can be tracked to parental lifestyle as well. Typically children follow learned behavior. If parents provide unhealthy foods, eat fast food, or don't feed children all children form bad habits and it creates a spiraling downward affect with the way they chose to live life.

Ming-Ling Fu wrote in his article, Association between Unhealthful Eating Patterns and Unfavorable Overall School Performance in Children said:

“There was a substantial positive association between unfavorable overall performance and high intake of low-quality foods, such as sweets and fried foods and low intake of high-quality foods, such as highly nutrient dense foods (vegetables, fruit, meat, fish, and eggs) and dairy products. The greater the number of unhealthful eating patterns, the higher the relative risk for unfavorable overall school performance.” (Ming-Ling Fu, 1938)

He also states that, “The study shows that children with unfavorable overall school performance were more likely to eat sweets and fried foods, and were less likely to eat foods rich in protein, vitamins, and minerals.” (Ming-Ling Fu, 1935) When looking at the article, Diet

Quality and Academic Performance written by Michelle D. Florence, Mark Asbridge, and Paul Veugelers, there were many citations regarding the issue of eating habits and school behavior. It is quoted that, “undernourished ,children have been shown to have decreased attendance, attention, and academic performance as well as experience more health problems compared to well-nourished children.” (Florence, 210) There are also studies suggesting the importance of breakfast and the positive benefits for student’s cognition, behavior, and academic performance. When looking closer even than that it was found the most successful is when students consume regular meals; meaning a balanced meal at each meal time. (Florence, 210)

When looking specifically at nutrients that were more beneficial than others it was found that, “Students with an increased fruit and vegetable intake and lower caloric intake of fat were significantly less likely to fail the assessment.” (Florence, 213) With that being said, fruits and vegetables are costly add-ons to a meal. Individuals who come from a low socioeconomic status most typically stay there due to the reoccurring rotation of parent to child economic and education level. Once an individual finds themselves in a poverty situation it is typically difficult to find a way to get back out. This affects everyone in the family and especially the children. It was stated that:

“Children from socioeconomically disadvantaged backgrounds are more likely to have poor diets and poor academic performance resulting in lower levels of educational attainment and poorer health outcomes. Over time, the cyclical and compounded effects of socioeconomic factors and diet quality on academic performance may contribute to future increases in socioeconomic disparities in health.” (Florence, 214)

Meaning that if when healthy eating is neglected or unavailable health issues may start arising. Individuals could develop diabetes or even worse issues due to being overweight or obese. It is quoted that:

“Childhood obesity often is accompanied by a parallel rise in type 2 diabetes, as well as increased rates of cardiovascular problems, hyperlipidemia, obstructive sleep apnea, asthma, orthopedic complications, nonalcoholic fatty liver disease, cancer, psychosocial complications, and lower measures of quality of life.”(Potts-Datema, 291)

When students, young individuals, are ill or have close family members who are ill they are at a higher risk of becoming moody, easily irritable, or emotional. Students who are already emotional due to puberty are already loose cannons, adding this on top can create or be the result of many behavioral issues in the classroom.

While, over-weight individuals are not all moody, irritable, or depressed there are still higher rates of these issues. This can also create low self-esteem which is destructive to a young person's ability and willingness to learn and engage in peer activities.

Conclusion

Although, data is in abundance, there is a limited amount of unbiased data detailing the correlation of nutrition, behavior in the classroom, and academic performance. When selecting which data to use there were significant citations that seemed to be a necessity to include. The importance of reporting how fruit and vegetable intake does have an impact on the amount of memory students can retain in a short-time span is just one of the many items that seemed to prove this theory.

My research questions help up and each question was able to be answered. I wanted to know how student's nutritional intake impacted their behavior and I found that there was a

connection and that it was beneficial for students to have a well-balanced breakfast before school. The question about student behavior and the impact on a student's academic performance was answered as well. If a student has poor behavioral habits in the classroom then they are unable to be actively present and engaged in the lesson. On the other side of this, if the lesson is not one where students are actively engaged then there is a much greater potential for behavioral issues. The last question of how nutrition affects academic performance was also well founded because if students are hungry then they are focusing on the hunger or the reason for being hungry rather than the task at hand.

As an educator, I found that the information researched and the data collected does indeed have an impact on how I handle my classroom. The fact that students function better on a full stomach connects many dots for me. Working in a low income community, many of my students have very rough home lives and it is their reality that a nutritious breakfast at home is farfetched. Knowing that it is a government funded and government requirement that free and reduced breakfast and lunch options are made available are beneficial to their ability to learn and behave in the classroom.

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