

An Analysis of the Perception of Nutritional Knowledge of Parents and Teachers:
Do We Really Know What Nutrients Do?

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Abstract

It has been argued for decades that good nutrition is extremely beneficial, but, how many parents and teachers actually use this information to help advance their children and students academically? Studies have been done showing that students in middle school make better choices when they have been taught about good nutrition. Students are at the mercy of their parents and teachers when it comes to the types of foods that are available from which they can choose. There is no research addressing this niche of the population. This study investigated the level of understanding of parents and teachers of students to determine if they know enough about good nutrition to be able to take advantage of the benefits of good nutrition for the academic advancement of their children and students in school.

The purpose of this study was to determine if parents and teachers understand the impact of good nutrition on the physical development of the body and brain of their children and students, especially on persons with an intellectual disability (ID). Furthermore, how parents and teachers then make different choices based on that information to help their children and students develop cognitively and emotionally.

The results show that parents and teachers believe they know about the same amount of information when it comes to nutrition. Parents know they should feed their children more nutritious food. Due to limited resources, there is not much that can be done about getting students with special needs the best nutrition possible, but there is plenty that can be done about increasing the knowledge base of parents and helping them make more conscious efforts to support their children's nutritional needs, especially for parents who have children with special needs.

The results also showed a discrepancy in the number of teachers who have a student with special needs in their classroom. It may simply be the respondents; however, the results showed that the number of teachers without a student with special needs was greater than those with. This was surprising in light of the national push for inclusion classrooms. The other surprising result was that parents are not intentionally using good nutrition to increase their child's chances for better brain function, even those parents with children with special needs.

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Chapter 1

Introduction

Background

It has been argued for decades that good nutrition is extremely beneficial, but, how many parents and teachers actually use that information to help advance their children and students academically? Study after study, which appear throughout this paper, have shown that people who have been taught about good nutrition will make better choices with what they eat. Unfortunately, there seem to be no studies available that show parents and teachers using this information to take advantage of the full benefits of this nutrition knowledge. Do parents and students really understand the impact nutrition has on behavior, cognition, and emotional health? If they do understand, do they make attempts to harness this knowledge to help improve the performance of their children and students in school?

A plethora of studies have been done showing that students in middle school, when taught about proper nutrition, know what to eat and will make better choices (Heo et. al., 2016; Xu & Jones, 2016; Brucker & Nord, 2016; Fahlman et. al., 2008). What does this really mean? Do people truly know why they are doing what they are doing in relation to what they eat? Do they truly know how to use the information about nutrition to their advantage? Knowing and choosing not to use the information about nutrition is one thing; knowing the information and not knowing how to use this information for one's benefit is completely different. This study investigated the level of understanding of parents and teachers of students to determine if they know enough about good nutrition

to be able to take advantage of the benefits of good nutrition for the academic advancement of their children and students in school.

Statement of Problem

Very little, if any, information has been collected and analyzed in regard to actual usage of nutritional education beyond outward behavior (i.e. reduced consumption of junk food and increased consumption of healthier options). There is proof of presumed nutritional retention within related studies pertaining to nutritional knowledge. However, the time frames considered in those studies were limited in scope, and do not suggest a long-term assimilation of behaviors, nor is there even a hint of the volition with which the parents and teachers choose to consume better options for the academic advancement of their children or students.

Purpose Statement

The purpose of this study was to determine if parents and teachers understand the impact of good nutrition on the physical development of the body and brain, especially for persons with an intellectual disability (ID), and then make different food choices based on that information to help their children and students develop cognitively and emotionally.

Guiding Questions

The following questions guided this study.

- Do parents and teachers believe they understand good nutrition?

- Do parents use this information about good nutrition to guide and direct their food choices for themselves and their children?
- Do teachers use this information about good nutrition to guide and direct their choices of food related incentives for the students in their classrooms?
- Do parents and teachers know that good nutrition will help enhance the body's ability to repair damage caused by either defect (i.e. problems during pregnancy or genetic) or environmental factors?
- Do teachers know that by encouraging increased understanding of good nutrition that this will influence their student's food choices, and even influence what foods and snacks their parents purchase for at home?

Hypotheses

In this study the investigator analyzed five sets of hypotheses.

Set one:

H_0 :

The mean number of parents with a child with special needs is equal to the mean number of parents without a child with special needs in regard to their understanding of good nutrition.

H_1 :

The mean number of parents with a child with special needs is not equal to the mean number of parents without a child with special needs in regard to their understanding of good nutrition.

Set two: H_0 :

The mean number of teachers with a child with special needs is equal to the mean number of teachers without a child with special needs in regard to their understanding of good nutrition.

 H_1 :

The mean number of teachers with a child with special needs is not equal to the mean number of teachers without a child with special needs in regard to their understanding of good nutrition.

Set three: H_0 :

The mean number of parents who think they are knowledgeable of good nutrition is equal to the mean number of teachers who think they are knowledgeable of good nutrition.

 H_1 :

The mean number of parents who think they are knowledgeable of good nutrition is not equal to the mean number of teachers who think they are knowledgeable of good nutrition.

Set Four: H_0 :

The mean number of parents who use the knowledge of good nutrition to support their child's growth and development is equal to the mean number of teachers who use the knowledge of good nutrition to support their student's growth and development.

H₁:

The mean number of parents who use the knowledge of good nutrition to support their child's growth and development is not equal to the mean number of teachers who use the knowledge of good nutrition to support their student's growth and development.

Set Five:

H₀:

The mean number of parents with a student with a disability who use nutrition to improve their child's learning ability through nutrition is larger than the mean number of parents without a child with a disability.

H₁:

The mean number of parents with a student with a disability who use nutrition to improve their child's learning ability through nutrition is less than or equal to the mean number of parents without a child with a disability.

Definition of Terms

- Special Education Student or Student with Special Needs - Any student with a diagnosed academic disability who also has an Individual Education Plan (IEP), and is receiving special education services or accommodations while at school.
- Poverty - Socio-economic status that qualifies the family, specifically the child(ren) or student(s), for free or reduced breakfast and/or lunch.
- Proper Nutrition - Healthier options for food and lifestyle as defined by the Food and Drug Administration (FDA).

- Healthier Options - Proper balance of fruits, vegetables, grains, and proteins - follow guidelines suggested by the FDA.
- Edge in Academics - increased transcendence of limitations brought about by academic or intellectual disabilities.

Chapter Summary

The information available in peer-reviewed research articles on the long-term use of good nutrition information is scant. This study investigated the level of understanding that parents and teachers have about what good nutrition is and how parents and teachers use this information to positively impact their children's and student's learning ability to physically improve their health and intellectual abilities, especially for students with special needs.

Chapter 2

Review of Related Literature

Purpose of the Study

The purpose of this study was to determine if parents and teachers understand the impact of good nutrition on the physical development of the body and brain of their children and students, especially on persons with an intellectual disability (ID). Furthermore, how parents and teachers then make different choices based on that information to help their children and students develop cognitively and emotionally.

Previous Research

There are years of research on the topic of nutrition and what good food does for the human body. Some of those studies have even investigated the effect school curriculum regarding nutrition has had on students and their food choices. There are even studies investigating specific areas of development that happens when the body gets the proper type of nutrients. However, this researcher could find no studies that investigated the intentional use of this information to guide and direct the food choices of children and students in order to affect a positive change on themselves or another person, specifically their child or student.

The areas of concentration for this study were: the effects of nutrition on intellectual development, the effectiveness in nutritional education, student's perception of nutrition and their food choices, the perception that parents have regarding their own understanding of nutrition, and the teacher's perception of their understanding of good nutrition.

Effects of Nutrition on Intellectual Development

It is safe to say that everyone on the planet knows that food is important for survival. Everyone eats. What they eat differs based on location, culture, and availability, but everyone eats. We need food in order to exist; no food, no life. Wars have been fought over food and the ability to grow or acquire it (Serrati et. al., 2000). There is also the age-old adage that “you are what you eat,” which has been used as the basis for many books and studies (Han & Dingemanse, 2017). If we eat poor quality food, we will get poor performance from our bodies. But is there more to it than this?

Despite there being decades of research available on the study of nutritional effects on the body and cognition, for the sake of this study the researcher only went back as far as a study published in 2001 as a starting point. In her article on “Nutrition and Cognitive Function,” Nicolas and his team researched the connection between many nutritional substances and cognitive function (Nicolas et. al., 2001). She concluded that there is a definite connection between cognitive function and certain vitamins, fats, glucose, and cholesterol in so far as the brain functions better when it is getting the right blend of these substances. We cannot have too many, nor can we have too few of these nutrients and substances.

After the turn of the century, researchers were looking more specifically into the connections between nutrition and brain function. Tanner and Finn-Stevenson concluded that there are decades of studies establishing “a strong association between malnutrition and physical growth delays in children” (2002). Her study examined nutrient conditions of a mother’s body prior to conception, throughout the pregnancy, and up to

approximately two years of age. Tanner and Finn-Stevenson found that “prenatal nutritional supplementation has long-lasting effects regardless of adequate nutrition in early childhood” (2002, p. 185). She also connected continued decline in cognitive function in the infant stages when adequate nutrients were not consumed. However, she did give readers and future researchers hope that there is “potential for recovery” (Tanner & Finn-Stevenson, 2002, p. 185).

A term that surfaced through out the research was epigenetics. The way that Powledge defined the term in her article was, “the study of mechanisms that change gene expression by modifying DNA without modifying its sequence of bases” (2009, p. 736). Powledge found a connection between “chronic metabolic disorders such as obesity and diabetes” and our brains (2009, p. 738). When the body is not getting the nutrients that it needs for optimal function, it processes food differently, which causes different responses to food.

In a three part series published in *The Lancet* on “Advancing Early Childhood Development,” the researchers took turns researching the connections between nutrient supplementation through out the entire pregnancy process through infancy (Black et. al.; Britto et. al.; Richter et. al.; 2017). Black and her team focused on how poverty played a significant role in the availability of quality nutrients in developmental years, and how those factors “influenced by genetic and epigenetic variation, underlie the attachment and early learning system, influencing subsequent health and development” (Black et. al., 2017, p. 77). Baritto and his team went further and considered lifestyles in intellectual development, but still connected nurturing environments with availability of nutrients (Baritto et. al., 2017). Deepening the study, Richter and her team concluded that

intellectual and emotional development is significantly enhanced and supported when started early in the life of a child, even as early as preconception (Richter et. al., 2017).

An additional study that was considered in this investigation was the NUTRIMENTHE project, which is a collaboration of European researchers who are studied the effects that nutrition has on cognitive development when consumed early in life (Anjos et. al., 2013). The research this group continues to do involves studying specific nutrients (i.e. iodine, choline, zinc, protein, and others) to investigate exactly what their effects are on intellectual development. Depending on the nutrient, the time at which it was taken, and amount that was consumed all have significant effects on how the brain develops, which, in turn, has a profound effect on the intellectual development of the brain (Anjos et. al., 2013).

Considering all of this information, collectively, would suggest a dismal future for anyone unlucky enough to be born into an economically disadvantaged situation without quality nutrition or support. However, there have been other studies detailed below that suggest that there is hope for everyone, even those with existing intellectual disabilities. While all of the studies considered suggest that early consumption of the certain nutrients by the mother will significantly increase the positive development of the brain, there are suggestions in recent research that supplementation throughout life will help reverse the negative effects that previous damage has caused in the brain.

The most optimistic report of reversing poor development and enhancing future development was in a study by Lee et al in *The Journal of Nursing Scholarship* (Lee et. al., 2016). Lee and his group studied persons with mild intellectual disabilities to determine what effect multivitamins would have on cognitive development in persons

over 65 years of age. They found that supplementation with a multivitamin improved cognitive function (Lee et. al., 2016). While their findings were more significant with patients with dementia, it does strongly suggest that supplementation will improve cognitive development regardless of the subject's condition.

The Effectiveness of Nutritional Education

This research project was originally going to be a study of the student's perspective of nutrition, especially those students with an intellectual disability. The researcher even did some small initial research projects in preparation for this study; however, the decision was made to concentrate on the parents and teachers since they are people who have the greatest influence on what children and students are provided to eat. A project like this would be remiss if it did not at least acknowledge the student's perspective.

The consistent message from all of the articles found was that nutritional education does have an effect on students, but typically only for a short time. All of the studies reviewed indicated that at least temporary change in eating habits and food choices occurred; however, all of the studies also suggested that there is no proof of long-term change in eating behaviors.

Of the eight studies of specific curriculum considered for this study, there was one report that looked at the Michigan Model (MM) of nutrition curriculum (Fahlmann et. al., 2008). This particular study stood out because it concentrated on a specific curriculum, in the Midwest area of the United States, and was focused on the middle school age group, which all corresponded with a mini research project this researcher was pursuing

in preparation for this research study. Those who had been taught with “the MM Nutritional Curriculum not only increased their nutrition knowledge but also were more likely to report making changes to their eating habits that reflect in healthier lifestyle” (Fahlmann et. al., 2008, p. 219-220). The article went on to report that there was an observed increase in fruit and vegetable consumption, and the students self-reported that they looked differently at fast food claiming to make healthier choices when making selections.

A strongly desired area of focus the researcher wanted to pursue was that of the level of understanding of nutrition by students with special needs. There are many studies showing the connections with nutritional issues and persons with an intellectual disability (ID). Unfortunately, none of the research found had anything to do with the effect of nutritional education on students with special needs. Based on prior research projects, the researcher found that students with special needs or intellectual disabilities have the same understanding of nutrition, but they are typically with families or in situations where they are not able to acquire the right types of foods to get the nutrients they need to affect any potential change for the positive (Brennen, 2017). The consensus was that the students knew that nutritious food was better for them, wanted to make better choices, but they were prevented from doing so because of lack of resources. It was this lack of resources that sparked the thought in the researcher’s mind that the research needed to look at the parents and teachers who are the primary sources of food and snacks in most of the student’s lives.

There is one glimmer of hope in the area of long-term behavior change specifically in middle school students. In a study by Peterson, et al, investigating the

effectiveness of the “Healthy Choices” program, the researchers saw an improvement in “weight-related behaviors and weight status” over a three year period (Peterson et. al, 2015, p. 2). Even though this study focused on weight, it is very encouraging to see the ability the students have to make changes in their lifestyle, and that those changes last longer than a few months. After what this researcher observed in these studies, that students do make good choices in snacks when offered the option, a weak conclusion that students with intellectual disabilities can also make long-term improvements to their *modus operandi*.

Parent’s Perception of Good Nutrition

Research pertaining specifically to parent’s perception of nutrition could not be found. There are studies that consider specific areas of health concerns such as obesity, diabetes, and other specific topics, but nothing in the area of knowledge. Parents are the primary source of nutrition for their children, so it makes sense to research what parents know about nutrition, as well as what some of the factors are that play into their food choices.

There was an interesting study done a few years ago investigating the effect of a program that promoted parental involvement in student’s consumption of fruits and vegetables. The program was called “Boost” and was rolled out for seventh graders who were approximately thirteen years of age. The nutritional information of fruits and vegetables was taught in the schools, and then their parents were encouraged to study the information as well. The result was that parents being involved in the learning process promote increased consumption of fruits and vegetables (Jorgensen et. al., 2016). This

conclusion corresponds well with this researcher's findings from his research projects (Brennen, 2017). If the parents purchase and provide the more nutritious foods, then the students will consume more fruits and vegetables, and consume more nutrients.

One important factor that affects parents and their ability to provide anything for their children is their financial situation. Even though it is not a major question for this research, it is important to note that poverty is a major factor in the prevalence of intellectual disabilities (Brucker & Nord, 2016). This also means that it is a factor for families providing the type of food that they do. If parents cannot afford to buy the more expensive, higher quality foods that have better nutritional value, then the students will not have access to them as easily. Research shows that lack of vital nutrients is a major factor in manifestations of attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorders (ASD), learning disorders, and intellectual disability (Brucker & Nord, 2016; Lee et. al., 2016; Black et. al., 2017; Britto et. al., 2017).

Teacher's Perception of Good Nutrition

There is a bit more research available in the area of teachers and nutritional education. Even though most of the research found on this subject had to do with opinions and attitudes toward nutritional education, it still offered helpful insights as to what teachers think and believe about nutrition in regard to their students.

As a special education teacher, this researcher has first-hand experience with teachers, snacks, incentives, intellectual disabilities, behavior conditions, and the effects of poverty. More often than they probably should, a student will say that he or she did not have breakfast, or that they are out of lunch money on their account, or that they are

simply hungry because they are off of their meds that day. It is also difficult to be a teacher and not learn that food is a significant motivator to work and participate in class for middle and high school students.

An interesting study that came out a couple years ago looked at teacher's readiness to teach nutrition, and how that impacts their delivery of the information, as well as the implementation in classroom practice. It was shown that how teachers perceive their own knowledge level of nutrition affects how they teach nutrition, how they promote good nutrition through out the school year, and how they use food as incentives in the class room (Perikkou et. al., 2016). Perikkou and his team also found that the teacher's own level of satisfaction in their own eating habits and their outlook on their overall health has a significant impact on how much of a role model they are for their students (2016). This finding supports a slightly older study concluding that teachers modeling behaviors in good nutrition is far better for teaching nutrition than by teaching alone (Derscheid et. al., 2009). Both Perikkou's team (2016) and Derscheid's team (2009) found that teachers believe that whatever they teach in the classroom would be greatly strengthened and supported by having it practiced at home.

What Do the Students Think?

One question kept surfacing throughout this literature research review process. What do the students think of what they are learning in school regarding nutrition? There are plenty of studies showing the effect of the programs and curriculum, several of which have already been cited. The student's perception is not a major factor in this research;

however, intellectual disability is a part of the research, and there are some interesting findings in some of the available research.

The concept of “food insecurity” was a trend in several of the articles, but one article stood out from the rest (Brucker et. al, 2016). The students considered in the research studies, especially those with intellectual disabilities, were of mixed levels of understanding, which is to be expected. While the students have differing levels of ability to understand, those students with higher abilities to understand expressed concern over limitations of resources. Because of increased costs of functioning (assistive technology, services, and living situations), it is more difficult to afford the more nutritious food options (Brucker et. al., 2016). In their respective submissions of a three-part series, researchers Black, Britto, and Richter, and their respective teams, all concluded that while students with intellectual disabilities can grasp the concepts, they typically do not follow through with them on their own for many different reasons such as: poverty, adverse childhood experiences, unstable environment and living conditions, and even diminished understanding and knowledge on the part of their parents (2017).

One study did not paint a good picture for students with intellectual disabilities and their understanding of nutritional information. Room, Timmermans, and Roodbol (2016) performed an in-depth study on what they call “metabolic syndrome” and found that persons with an intellectual disability, especially those taking medications to help control their symptoms, have a greater need for nutritional support than anyone else. On the more positive side of the spectrum, there are studies showing that students with intellectual disabilities can learn about good nutrition. While Xu and Jones (2016) concentrated his research mainly on obesity, and did not consider other aspects of the

effects, Heo and his team (2016) had a broader perspective in his research. Both concluded that specific and concentrated nutritional education is highly effective in the areas of nutrition, physical activity, and mental health (Heo et. al., 2016; Xu & Jones, 2016).

Impact of Findings

The number of diagnosed cases of learning disabilities, specifically intellectual disability, is increasing. Nutrition is a contributing factor that cannot be ignored. Even if the larger picture of overall health for persons with intellectual disabilities, nutrition helps control blood sugar, mood, energy, strength, and many more features. It is important, therefore, to make sure that as many people know about good nutrition as possible, and who is more important than those with the disability, their parents or caregivers, and their teachers.

The findings of this literature review have shown that researchers have considered many aspects of nutrition as well as nutritional education in the past, but none of them looked directly at what parents and teachers think of their ability to support and teach their children and students. All students, especially persons with intellectual disabilities, are dependent upon their parents, caregivers, and teachers to meet their needs. It is important to understand how all of those groups understand nutrition, how it effects people, and what can be done to help increase their knowledge of nutrition in order to encourage increased understanding, and thereby increased ability and function of those students with disabilities.

Parents and their children, especially children with special needs, should know as much as they can about how nutrition can significantly improve their lives, even and

especially with their intellectual abilities. There is research on what nutrients should be consumed by a mother in order to reduce the chances of birth defects, including intellectual disability (Tanner & Finn-Stevenson, 2002). When a person puts good nutrition into their body, the body will take care of itself, and in many cases, improve itself. There is a need to make sure that parents know what is going to help their children function the best, and there need to be educational programs that help make this happen.

Teachers play a different role in the process of nutritional education. They are typically the ones who make sure that people know what they need to know regarding any topic they are asked to teach. Teachers need to know the information, and should be willing to live by the information. As role models, teachers also should be willing to conduct their classrooms in a way that shows they support what they are teaching in some way. If they are teaching a topic they do not know about, they need to do their best to acquire the information they need to teach with fidelity.

One struggle teachers have is with finding ways of motivating their students to participate in class, complete assignments, get involved in activities, and not be a distraction to the other students. One of the ways teachers do that is with food incentives. While teachers would prefer to have healthy options, the cost and storage of healthier snacks makes it difficult to so. Thankfully, there are more and more options coming onto the market to reduce the amount of sugar and chemicals, and increase the amount of organic, natural, and healthy options that students will still eat and consider worthy of some effort.

Chapter Summary

Knowledge of nutrition is very important. When the human body gets the nutrition it needs, it will take care of itself. If people do not know what good nutrition is, they will not do what is needed in order to consume the right nutrients in order to get the desired result. The same is more so the case for persons with intellectual disabilities, who are dependent upon their parents and caregivers to provide them the necessary nutrients to support their extra developmental needs.

There is a lack of quantitative research on the perception of parents and teachers on their ability to understand nutrition well enough to provide their children and students the nutrients that they need, even those parents and teachers with children and students with special needs. Research has been done on related topics such as obesity and physical activity. The research did show that programs and curriculum designed to increase knowledge of nutritional information do help, both at the level of the student, as well as at the parent and teacher levels. There is still work that needs to be done to raise the awareness of how important nutrition is – the types of improvements that can be made in the human body – and what should be done to improve understanding of how to apply this knowledge into practice.

Chapter 3

Methodology

Purpose of the Study

The purpose of this study was to determine if parents and teachers understand the impact of good nutrition on the physical development of the body and brain of their children and students, especially on persons with an intellectual disability (ID). Furthermore, how parents and teachers then make different choices based on that information to help their children and students develop cognitively and emotionally.

Data Collection

To collect data for this research, a survey was created and distributed to the parent and teacher participants. The questions in the survey (see Appendix A) were intended to get an honest answer from the participants without guiding their responses on subsequent questions. The questions asked were intended to collect responses in six main areas: very basic demographics, nutritional education, perception of their knowledge, awareness that nutrition affects intellectual ability, personal eating tendencies, and their willingness to have better quality snacks and food available for themselves and their children or students.

The demographic information was not a high priority for this research. The only information points collected were: gender, their role (parent or teacher), income level, and if they have a child or student with an Individual Education Plan (IEP). For this study, data points such as location within the country or educational level or another point were considered. This type of information may be considered in future research.

The fact that the participants received instruction in nutritional information when they were in school was very pertinent for this research. If they do not know about something, how could they be influenced by the information?

It was challenging to write questions in a way that would not influence answers or responses to subsequent questions, but still capture honest and pertinent information. The questions, which were included in this study are in the survey attached (Appendix A).

Subjects Studied

Originally, the researcher wanted to study students in special education, especially those students with intellectual disabilities. Due to restrictions within the school where the researcher worked, that was not possible. The scope of the research shifted then to the parents and teachers of the same students. Unfortunately, the level of participation of those parents was not what was needed to perform any sufficient comparative studies. The scope then shifted to all parents and teachers that were willing and able to participate in the survey. The original goal was to have a minimum of 50 participants. At the end of the data collection time frame, there was a sample size of 89 participants.

The collection process is discussed in the next section of this chapter. Due to the way responses were collected, it is important to mention now that the survey was distributed via Facebook in order to increase the number of responses and keep respondents identity confidential. That is the reason why most of the demographic information was superfluous, and the researcher is not able to describe in detail the make up of the respondents.

Procedures

Once the survey was created, it was tested on ten teachers who were friends of the researcher to determine if the questions made sense. The test subjects were simply asked to take the survey with the intent to provide feedback on the survey itself. Once the test subject completed the survey, the quality of the survey was discussed in detail. It was at this point that the test subjects were informed of the intent and purpose of the research project. Adjustments were made to the survey based on the feedback received from the volunteer test subjects.

When the survey was finalized, it was distributed to potential respondents via email. The initial email blast was sent to friends, relatives, colleagues, and parents of former students. Since that list did not net enough responses, the survey was posted on Facebook and published publicly for anyone to respond. The survey system (Google Survey) did not collect any respondent data other than what was requested in the survey. The researcher had no idea who was responding, nor did he know when they were responding. The program did collect a date and time of the response, but that information was omitted prior to analyzing the data.

Data was collected over a thirty-six day period (September 14, 2017-October 19, 2017). The data was ignored for an additional fourteen days to ensure full separation from the data to remove any potential bias from the data collection process. At this point, each response for each question was assigned a number value to aid in the process of analyzing the data. For example, gender responses were coded as male equals one (1) and female equals two (2). For the questions where a response was scaled, the responses were coded as Strongly Agree equals one (1), Agree equals two (2), Not Sure equals

three (3), Disagree equals four (4), and Strongly Disagree equals five (5). Respondents were given the opportunity to add comments or thoughts at the end of the survey. After the survey data was coded, it was set-aside again for another week to help make sure that a bias was not present in the process.

Description of Data Analysis Strategy

Normally, for educational research, researchers use a 5% significance level as the benchmark for accepting or rejecting a null hypothesis. However, since there is limited research on this topic, the researcher went with a 10% (0.10) significance level. This is ground breaking research that will impact future research, and potentially influence educational programs in the future. Students need to know what good nutrition can do for them, which will create parents who know what good nutrition can do for them, which, in turn, creates teachers who know what good nutrition can do for them.

After the data was coded to make data analysis easier, the data analysis component of Microsoft Excel was used to run t-tests, the results of which are discussed in the next chapter, and listed in Appendices B through F. All five of the hypotheses were analyzed using a standard, two-tail t-test.

Chapter Summary

The data collection process took longer than originally anticipated. The minimum number of results needed to have proper analysis did not come with the first distribution wave via email. Once the survey was posted on Facebook and was available to anyone who was willing to take the survey, plenty of responses were received, which provided a

sample size of 89 voluntary participants. Though this was not entirely desired, it was anticipated. The researcher wanted to try to keep the results localized to a certain geographic area, but that could not be assured when posting the survey online to the entire online world. At the same time, this made the research generalized enough to be considered broad-based and more representative of the country and not limited to a specific geographic location.

Once the data was collected, a process of assigning a numerical value to the responses, pulling the information needed to analyze the hypotheses, run the t-tests, and determine the results was conducted. Two of the hypotheses ended up being different than originally thought, but the main research is done is to determine the viability of thoughts and opinions.

Chapter 4

Results

Purpose of the Study

The purpose of this study was to determine if parents and teachers understand the impact of good nutrition on the physical development of the body and brain of their children and students, especially on persons with an intellectual disability (ID).

Furthermore, how parents and teachers then make different choices based on that information to help their children and students develop cognitively and emotionally.

Research Results

Because the previous research on this topic is so limited, the significance level for rejecting the null hypothesis was set at 10% (.10). A summary of the data analysis is provided in Table 1 below. A report on the results follows.

Table 1 – Data Analysis Results

Hypothesis	t-critical (two tail)	t- statistic	p-value	Decision
One	+/- 1.67	0.57	0.57	Accept Null
Two	+/- 1.73	1.76	0.09	Reject Null; Accept Research
Three	+/- 1.68	0.77	0.45	Accept Null
Four	+/- 1.68	0.60	0.55	Accept Null
Five	+/- 1.71	1.88	0.07	Reject Null; Accept Research

See Appendices B to F for data analysis

Set one:

H_0 :

The mean number of parents with a child with special needs is equal to the mean number of parents without a child with special needs in regard to their understanding of good nutrition.

H₁:

The mean number of parents with a child with special needs is not equal to the mean number of parents without a child with special needs in regard to their understanding of good nutrition.

Results:

There was not a significant difference between parents with or without a child with special needs are different when it comes to the parent's level of understanding in regard to nutritional information. The t-statistic was (-0.57) which was not beyond the t-critical number (+/- 1.67). The p-value of .57 indicates we would make an error 57% of the time if the null hypothesis is rejected.

Set two:

H₀:

The mean number of teachers with a child with special needs is equal to the mean number of teachers without a child with special needs in regard to their understanding of good nutrition.

H₁:

The mean number of teachers with a child with special needs is not equal to the mean number of teachers without a child with special needs in regard to their understanding of good nutrition.

Results:

The results of this hypothesis analysis were surprising when one considers the current trend of including students with special needs in the regular education setting, at least in public school systems. The data analysis showed a significant difference between

the two groups. The t-statistical number (-1.76) was definitely within the rejection range for the t-critical number (+/- 1.73). The confidence in rejection of the Null and acceptance of the Research hypothesis is supported by the low p-value (0.09).

Set three:

H₀:

The mean number of parents who think they are knowledgeable of good nutrition is equal to the mean number of teachers who think they are knowledgeable of good nutrition.

H₁:

The mean number of parents who think they are knowledgeable of good nutrition is not equal to the mean number of teachers who think they are knowledgeable of good nutrition.

Results:

There was not a significant difference between the number of parents and teachers who think they are knowledgeable of good nutrition. The t-statistic was (0.77) which was not large enough to reject the Null hypothesis (+/- 1.68). The p-value of (0.45) is not small enough to reject the Null hypothesis at .10 level.

Set Four:

H₀:

The mean number of parents who use the knowledge of good nutrition to support their child's growth and development is equal to the mean number of teachers who use the knowledge of good nutrition to support their student's growth and development.

H₁:

The mean number of parents who use the knowledge of good nutrition to support their child's growth and development is not equal to the mean number of teachers who use the knowledge of good nutrition to support their student's growth and development.

Results:

The t-statistic of (0.60) was not large enough to reject the Null hypothesis. There is not a significant difference based on the t-critical number (+/- 1.68), especially when there would be a 55 percent chance (p=0.55) that we would be wrong in rejecting hypothesis four.

Set Five:

H₀:

The mean number of parents with a student with a disability who use nutrition to improve their child's learning ability through nutrition is larger than the mean number of parents without a child with a disability.

H₁:

The mean number of parents with a student with a disability who use nutrition to improve their child's learning ability through nutrition is less than or equal to the mean number of parents without a child with a disability.

Results:

The results of this hypothesis analysis indicates that parents who have children with special needs are not all that different from parents without children with special needs in the use of their knowledge of nutrition; therefore, Null hypothesis five was rejected and Research hypothesis five was accepted. The t-statistic of (1.88) was larger

than the t-critical number (± 1.71) to reject Null five at the .10 level. At p-value of 0.07 supports this rejection. This result shows that parents are equal in their ability and willingness to provide the nutrition their children need, regardless of the intellectual ability of their children and the elevated need of the disability.

Chapter Summary

The data analysis results show that parents and teachers believe they know about the same amount of information when it comes to nutrition. Parents will be parents, regardless of the intellectual ability of their children; they know they should feed their children more nutritious food. Since teachers are typically parents as well, there is common ground when it comes to how they use the information they have. The surprises came in the area of teachers having students with special needs in their class, and parents intentionally choosing food options with the intent of improving their student's chances of academic improvement. There is not much that can be done about getting students with special needs into every classroom, but there is plenty that can be done about increasing the knowledge base of parents and helping them make more conscious efforts to support their children's nutritional needs, especially for parents who have children with special needs.

Chapter 5

Discussion, Conclusions, Implications

Purpose of the Study

The purpose of this study was to determine if parents and teachers understand the impact of good nutrition on the physical development of the body and brain of their children and students, especially on persons with an intellectual disability (ID). Furthermore, how parents and teachers then make different choices based on that information to help their children and students develop cognitively and emotionally was studied.

Discussion

The data analysis findings were not surprising that three of the five null hypotheses considered were accepted.

H₀ One:

The mean number of parents with a child with special needs is equal to the mean number of parents without a child with special needs in regard to their understanding of good nutrition.

H₀ Three:

The mean number of parents who think they are knowledgeable of good nutrition is equal to the mean number of teachers who think they are knowledgeable of good nutrition.

H₀ Four:

The mean number of parents who use the knowledge of good nutrition to support their child's growth and development is equal to the mean number of teachers who use the knowledge of good nutrition to support their student's growth and development.

Previous research found that those parents know what they know about nutrition whether they have a child with a special need, or a child with no diagnosed special needs (Heo et. al., 2016). It is incumbent upon the parent, and even the teacher, to do their own research and acquire the additional information they need to know what is best for their children. Research also shows that the only advantage that teachers have over parents when it comes to knowledge of good nutrition is that teachers have curriculum that they are able to use, thereby giving them a slight edge (Derscheid et. al., 2010). Absent of the curriculum, there is no advantage to being a teacher when it comes to nutritional knowledge. As far as assimilating the knowledge of nutrition into their lives and making it a part of their food choices, Perikkou (2014) suggests that teacher are probably more ready than parents, but that is only because teachers that have been teaching a while have witnessed the affects of the curriculum, and therefore are more apt to apply their knowledge.

It makes sense that parents and teachers would have about the same confidence level in their ability to understand and use what they learned in school regarding nutrition information. After all, in most cases, teachers are parents as well. Parents seem to do what they can with the means they have in order to provide and care for their children.

Teachers, in a similar vein, do what they can for their students, but with the added challenge of not being able to control what is done in their student's homes. It also makes sense that parents know what they know, and, unless they have a child with an eating disorder, there is not much incentive for them to gain additional information about nutrition simply because they have a child with a special need. These findings indicate that educators should model what they know and understand, and make sure they have more nutritious snacks available when a student needs one, and especially if the teachers is using food as an incentive in the classroom.

One of the most interesting findings from this research study was that there are more teachers in the field who report not having a student with a disability in their classroom. Being a special education teacher, the researcher was surprised, especially in light of the national push for including students with special needs in regular education classrooms. It was assumed that there would not be that much of a discrepancy. The other realization more so than a surprise was with the fact that parents who have children with special needs do not do more to increase the nutrient intake of their children versus those parents with children on the normal side of the spectrum. It probably should not have been surprising because parents with children with special needs typically have additional expenses that potentially prevent them from acquiring the necessary nutrients needed to increase their child's body's ability to take care of or even correct any ailment present in their system.

The two hypotheses that were rejected were slightly surprising.

H₀ Two:

The mean number of teachers with a child with special needs is equal to the mean number of teachers without a child with special needs in regard to their understanding of good nutrition.

H₀ Five:

The mean number of parents with a student with a disability who use nutrition to improve their child's learning ability through nutrition is larger than the mean number of parents without a child with a disability.

Hypothesis Two was an interesting discovery. Because of the national push to make sure students with special needs are included in the regular education classroom, it was eye-opening to find that so many of the teachers who responded indicated that they did not have any students with special needs in their classrooms. Of course, it could be that the respondents are the exception and not the rule, but it is very interesting to see the data show the lack of inclusion in classrooms.

Hypothesis Five was also an interesting discovery. The assumption was that all parents would do everything they can for their children, and if that means getting the best nutrition that they can in order to boost their child's chances for improvement, then they would do it. However, that assumption did not include poverty, indifference, and inability. Not everyone is the same, and certainly not everyone is like this researcher in their approach to doing whatever it takes to help someone succeed in life. That is not a critique of parents, it is a critique of the researcher's assumption.

Recommendations

This research study strongly supports an enhancement of the current curriculum being used in the middle schools to include exactly what nutrients do in a human body. The current curriculum teaches that good nutrition is needed for better body functioning, and the better the quality the food is, the better it will be for the body (Anjos et. al., 2013; Fahlman et. al., 2008). Several studies considered in this research shows that what is currently being taught in schools helps student's understanding that eating good food is good, and eating junk food is bad (Heo et. al., 2016; Xu & Jones, 2016; Anjos et. al, 2013). This study also suggests that more should be done about teaching people what nutrients really do in the body, and how the body can improve itself when it has what it needs. Parents and teachers would be much more intentional with food choices if they knew exactly how nutrition is more life-changing, and not merely at the level that fruit and vegetables are better for a person than potato chips or Yoo-Hoo.

Limitations

The first thing that the researcher would change for future investigations is the point-value assigned to the answers in the survey. Instead of having Strongly Agree being only one point, it should be the highest point value. That makes more sense from a psychological standpoint: the higher the ranking, the higher the points.

Another aspect of this study that the researcher would recommend changing for future research studies is the number and type of respondents. Even though there were enough respondents to do the analysis in this study, having another three to four hundred

responses from around the country would be good to broaden what is happening in other regions of the country as well, and offer a broader baseline to generalize results. The investigator would also increase the number of parents and teachers who have children or students with special needs, which might provide more accurate data for a better perspective on this topic.

Another aspect that the researcher would change in a future study would be adding a qualitative perspective. It is good to have numbers, and see the significance between groups and/or ideas. Delving into the why respondents responded the way they did, and why they feel the way they do, would be very helpful in knowing what needs to be done for developing a better curriculum and information sources for the future. Data analysis and numbers are helpful, but knowing why those numbers are what they are could be revolutionary in ascertaining insight and perspective.

Implications

The first thing that should be done with this information is to use it to guide the expansion of the curriculum used in school health classes. Healthier class curriculum should include information on specific nutrients and what a human body can do with it. Students should be taught about what nutrients are needed for optimal health, for intellectual health, and for gestational health. The more that they know about nutrition, the more that can be done to increase their ability to combat certain symptoms of deficiency, especially in the area of intellectual disability. If people knew what nutrients can do, the less junk food would be consumed, and more fruits and vegetables would be eaten.

A few questions kept surfacing throughout this entire research process. Has something happened to the quality of fruits and vegetables because of genetic modifications, and do they have as much nutrition as they used to have? Has the quality of the nutrient been affected with all of the chemicals that are used to protect and process the food being supplied? Has society become too obsessed with price and convenience that quality is sacrificed because of it? Is the apparent increase in instances and diagnoses of intellectual disability and other disabilities due to a deficiency in nutritional quality caused by the chemical and genetic modification made to fruits and vegetables?

Conclusions

There are so many things that can and should be done in regard to teaching students and parents about what they need to know about the food they eat. It is more than just eating fruits and vegetables. It is more than just eating less junk food. It is knowing what the human body needs to operate minimally and optimally, and then finding a way of getting everyone to the minimum, and then encourage them to strive for optimum levels of intake. Lives are on the line, and everything should be done to ensure that people are equipped with the knowledge they need to make the best decisions possible, especially in regard to persons with special needs.

Chapter Summary

Do we really know what nutrients do? For the most part, the curriculum being taught in schools is adequate for teaching the basics. Students make better decisions after they know what junk food is really doing to their bodies. Parents shop more smartly

when they know what their children need. Teachers support and teach the assimilation of the information as they model what they teach, as well as use better food choices with their incentives. At the same time, there is a significant amount that can and should be taught to everyone about what is consumed.

Elementary students should be taught the basics: fruit and vegetables are good, and junk food is bad. Middle school students should be taught what a body does with food: how it produces and uses energy from food, and what are the best foods for that process. High school students should be taught about specific nutrients, the results, and how to increase the intake of the nutrients they need to live and function at an optimal level. Parents should be offered the opportunity to join their children in the learning process, thereby making them accountable for knowing what their children know. Knowledge is power, and making sure everyone knows what they need to know is paramount to making significant changes in the future of the human race. This might reduce the number of diagnoses of intellectual disabilities. This could also reduce the number of cases of Attention Deficit and Hyperactivity Disorder (ADHD). This, in turn, might increase the number of intellectually high-functioning students, and thereby improve the future workforce of America. Collectively, this would likely increase the overall health of the nation, and thereby reduce illness across the board.

People need to know as much as they can in order to make the individual lives of everyone, especially those persons with special needs, as accessible and bright as possible.

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Appendix A**Survey**

1. Sex
 - a. Male (1)
 - b. Female (2)
2. What is your role in regard to children?
 - a. Parent (1)
 - b. Teacher (2)
3. What is your approximate household income? (One aspect being considered is income and the affects as such; please consider answering.)
 - a. \$0.00 - \$15,000 per year (1)
 - b. \$15,001 - \$25,000 per year (2)
 - c. \$25,001 - \$50,000 per year (3)
 - d. \$50,001 - \$75,000 per year (4)
 - e. \$75,001 – more per year (5)
 - f. Prefer not to answer
4. Do you have a student with special needs or has an IEP?
 - a. Yes (1)
 - b. No (2)
5. What nutrition taught to you in school?
 - a. Yes (1)
 - b. No (2)
 - c. I do not remember (3)
6. How comfortable are you with the concept of good nutrition?
 - a. I do not remember anything about nutrition from school. (1)
 - b. I remember the basics, but that is about it. (2)
 - c. I understand good nutrition, and do what I can to follow the guidelines. (3)
 - d. I am an expert, and help people with their nutritional needs. (4)
7. I was taught that good nutrition is important, but they did not really explain much, just that we should eat well.
 - a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
8. I use what I learned in school about good nutrition to guide and influence my food choices.
 - a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
9. I know that my health, and even my ability to think, is affected by the food choices that I make.

- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
10. It is better to eat fruits and vegetables than candy and sweets.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
11. It is better to eat natural food rather than chemically modified foods.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
12. My body functions better when I eat nutritious food (“eat healthy”).
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
13. My brain seems to function better when I eat nutritious foods.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
14. It is true that intellectual ability (brain function) improves when I eat nutritious food.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
15. I do everything that I can to get the nutrients to help my child/student perform at their intellectual best.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
16. I have healthy snacks (i.e. fruit, vegetables, granola, etc) available at all times.
- a. Strongly Agree (1)
 - b. Agree (2)

- c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
17. It is difficult to have healthy snacks and nutritious food available.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
18. Healthy snacks and nutritious foods are expensive.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
19. The food and drinks my children or students eat affects his/her/their performance in school.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
20. I know that good food with lots of vitamins and minerals will help my student's brain, and I do the best I can with the resources I have available to me.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
21. I wish there was a way for me to learn more about good nutrition and how it affects the body and mind.
- a. Strongly Agree (1)
 - b. Agree (2)
 - c. Not Sure (3)
 - d. Disagree (4)
 - e. Strongly Disagree (5)
22. If you would like to provide any additional information on the importance of nutrition, please do so below. Thank you for participating in this survey.

Appendix B**Research Data****Data for Hypothesis One**

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	2.757575758	2.839285714
Variance	0.501893939	0.282792208
Observations	33	56
Hypothesized Mean Difference	0	
df	53	
	-	
t Stat	0.574074774	
P(T<=t) one-tail	0.284172846	
t Critical one-tail	1.297729843	
P(T<=t) two-tail	0.568345693	
t Critical two-tail	1.674116237	

Variable 1 – Parents with a child with special needs

Variable 2 – Parents without a child with special needs

Appendix C

Research Data

Data for Hypothesis Two

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	2.5625	3
Variance	0.2625	0.545454545
Observations	16	12
Hypothesized Mean Difference	0	
df	19	
	-	
t Stat	1.759018096	
P(T<=t) one-tail	0.047334669	
t Critical one-tail	1.327728209	
P(T<=t) two-tail	0.094669338	
t Critical two-tail	1.729132812	

Variable 1 – Teachers with a student with special needs

Variable 2 – Teachers without a student with special needs

Appendix D**Research Data****Data for Hypothesis Three**

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	4.68852459	4.464285714
Variance	1.418032787	1.739417989
Observations	61	28
Hypothesized Mean Difference	0	
df	48	
t Stat	0.767471146	
P(T<=t) one-tail	0.223280187	
t Critical one-tail	1.299438879	
P(T<=t) two-tail	0.446560375	
t Critical two-tail	1.677224196	

Variable 1 – Parents who think they are knowledgeable of good nutrition

Variable 2 – Parents who do not think they are knowledgeable of good nutrition

Appendix E

Research Data

Data for Hypothesis Four

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	2.836065574	2.75
Variance	0.339344262	0.416666667
Observations	61	28
Hypothesized Mean Difference	0	
df	48	
t Stat	0.601931149	
P(T<=t) one-tail	0.27502639	
t Critical one-tail	1.299438879	
P(T<=t) two-tail	0.550052781	
t Critical two-tail	1.677224196	

Variable 1 – Parents who use their knowledge of good nutrition to support their child's growth and development

Variable 2 – Teachers who use their knowledge of good nutrition to support their student's growth and development

Appendix F

Research Data

Data for Hypothesis Five

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	3.75	3.111111111
Variance	1.4	1.237373737
Observations	16	45
Hypothesized Mean Difference	0	
df	25	
t Stat	1.884003535	
P(T<=t) one-tail	0.035622691	
t Critical one-tail	1.316345073	
P(T<=t) two-tail	0.071245382	
t Critical two-tail	1.708140761	

Variable 1 – Parents of a student with a disability who use nutrition to improve their child's learning ability

Variable 2 – Parents of a student with a disability who do not use nutrition to improve their child's learning ability