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The Importance of Nutrition for Development in Early Childhood

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THE IMPORTANCE OF NUTRITION FOR DEVELOPMENT IN EARLY
CHILDHOOD

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Child Development

by
Kaitlyn Sue Suha
December 2020

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ABSTRACT

Understanding which foods contain the necessary vitamins and nutrients for a child's health, and which ones are lacking, can decrease the likelihood of children developing nutritional deficiencies and promote their overall developmental health. It is important for parents of young children to have an understanding of nutrition and the effect that poor nutrition can have. This project presented information sessions to parents to educate them further about these important topics through four weekly online workshops. Participants were asked to complete a pre- and post-session survey. Survey results scores indicated that participants reported an increase in knowledge and understanding in regards to the importance of child nutrition.

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CHAPTER ONE

INTRODUCTION

Understanding which foods contain the necessary vitamins and nutrients for a child's health, and which ones are lacking, can decrease the likelihood of children developing nutritional deficiencies and promote their overall cognitive health. It is important for parents of young children to understand the importance of nutrition and the effect that poor nutrition can have. Development in early childhood is associated with a higher demand for nutrients and energy in order to support the physical needs of the body for rapid growth and brain development, rapid recovery following infection, and for general movement; hence, preschool-aged children are particularly vulnerable to nutritional deficiency (Taylor, Gallagher, & McCullough, 2004). Preschool-aged children with health concerns due to diet have become more common in recent years; the World Health Organization (WHO) reported that in 2013, the global number of overweight preschool aged children was estimated to be over 42 million ("WHO | Childhood overweight and obesity", 2015). Therefore, the primary goal of this project is to create a program aimed to educate parents and caregivers on the impact a well-balanced diet has on the developing child so that they might use this knowledge when working with and caring for children and promote healthy eating habits as the child grows.

The Importance of Nutrition

Nutrition is key for young children. Rapid brain growth occurs throughout the first 5 to 6 years of a child's life and much of this development is completed before the age of 2 as the child's genetics and environment work to advance this development. Nutrition through vitamins and nutrients is a key influence; if provided in ample amounts, the brain may develop to full potential (Nyaradi, Li, Hickling, Foster, & Oddy, 2013). Unfortunately, children are not consuming the healthy foods that they need to fuel brain development. Due to the prevalence of snack foods and fast foods in America, The Center for Disease Control and Prevention reported in 2015 that children are consuming 40% of their daily calories from some type of fast food. Oftentimes these foods can be eaten quickly and easily and are given to children for this reason. However, for meals to be quick and easy, they often are high in sodium and contain preservatives and lack the nutrition content needed for a healthy diet. The Center for Disease Control and Prevention explains that many of these foods are comprised of empty carbohydrates like sugar and unhealthy fats while lacking in the healthy ingredients essential for the body. Over time, children who regularly consume these foods may face deficiencies in specific nutrients as these quick meals are less likely to contain needed nutrients. Poti, Slining, and Popkin (2013) investigated ingredients in commonly eaten fast food meals of children age 2 to 18 years old and found that these foods often contain more than the recommended daily intake of sodium and are comprised of fillers such as corn,

which is considered to be an empty carbohydrate. The researchers also found high amounts of sugar and lower amounts of essential nutrients such as fiber and protein in these foods.

The Impact of Dietary Choices on Development

Calories

Children should neither have too few or too many calories. Without a healthy diet, child development can be hindered. A calorie deficit or surplus in the early stages of life may lead to lasting long-term effects even after diet correction (Khan, Raine, Donovan, & Hillman, 2014). Malnutrition can create serious issues for children in the first 5 years of life mainly due to the fact that nutrient-rich foods are necessary in a young child's diet because of the major brain development that occurs within the first few years of life (Rosales, Reznick, & Zeisel, 2009). When children are underfed and calorie deficient over an extended period, serious cognitive issues can arise. A study looking at children living in poverty found that those with low calorie, nutrition deficient diets early in life had poorer IQ levels, cognitive function, and greater behavioral problems later in life (Prado & Dewey, 2014). Mohd Nasir and colleagues (2012) found that lower amounts of food intake caused from skipping meals, breakfast and/or dinner, equate to lower amounts of energy overall which then contribute to lower cognitive functioning. This study suggests that when calorie counts are low, children lack the energy needed for cognitive processing and are less alert throughout the day. These effects can carry over to the child's ability to stay alert in class, retain new

information, and complete homework assignments, which is crucial for overall success in school.

High calorie diets may be problematic as well as they may lead excessive weight gain and obesity which can impact development for children (Khan et al., 2014). The idea that overweight children may be impacted cognitively is thought to be due to impaired insulin receptor signaling, low levels of leptin in the brain, and altered glucose metabolism which can arise when the body is provided with an overabundance of calories for an extended time (Farr, Banks, & Morley, 2006). Looking at the potential impact of excessive weight in children, Mond, Stich, Hay, Kraemer, & Baune (2007) conducted a 9-year longitudinal study on children from 4 years to 8 years of age comparing their body mass index (BMI) scores to their abilities in areas related to motor, speech, cognitive, and psychosocial development. The results found that impairment in gross motor skills was higher among obese male children than those of a normal weight, and a lessened ability to focus attention was witnessed in obese female children when compared to female children of a normal weight. Though male and female children appeared to have different impairments, both genders, overall, were negatively impacted by an overabundance of calories in the diet for a prolonged time. Other research has linked prolonged high caloric diets in school-aged children to impairments in cognitive functioning, specifically in terms of mathematics comprehension (Li & O'Connell, 2012) and to decreased visual spatial organization (Y. Li, Dai, Jackson, & Zhang, 2008).

Furthermore, a review of the effects of a long term high fat diet on the body highlights that a high fat diet is a known contributor of vascular inflammation and insulin resistance which leads to type 2 diabetes and excessive fatty acid consumption (Freeman, Haley-Zitlin, Rosenberger, & Granholm, 2014). A review written by Biro and Wien (2010) on childhood obesity found that a diet founded on prolonged consumption of calories can increase negative health consequences for ailments such as type 2 diabetes and metabolic syndrome. Given the negative consequences of childhood obesity, it is important to gain a better understanding of factors contributing to overeating and obesity in children in order to develop effective treatments and prevention strategies such as limiting daily calorie intake (Werthmann et al., 2015).

Overview of Vitamins

The brain requires an ample supply of vitamins, as well as other enzymes and minerals, in order to sustain and build neural connections during development. Insufficient amounts of these necessities can lead to a decrease in cognitive development affecting children's overall mental health (Swaminathan, Edward, & Kurpad, 2013). Researchers Khan, Raine, Donovan and Hillman, (2014) note that newborns face many health risks when not provided with recommended vitamins and minerals during early infancy, establishing that even in the first few months of life, nutrition is crucial for development and that micronutrients play a large role in a young child's development, and when not sufficiently supplied, deficits can lead to lasting issues.

Vitamin B

The human brain, like the body, requires vitamins and nutrients in order to sustain itself and perform optimally. When adults are deficient in vitamin B12, a vitamin in the B vitamin complex, cognitive issues can occur causing severe impairment in certain situations. A study assessed a group of 60 adults who were categorized as mildly cognitively impaired and suffering from a vitamin B12 deficiency. The sample was given B12 supplementation over 6 months via injections of 1mg a day for one week followed by 1mg once weekly for the remaining months. After the B12 injections had been administered, the sample group was then again assessed for cognitive ability. Results showed that vitamin B12 returned to normal levels and cognitive scores increased (Chauhan & Agarwal, 2016). A similar study assessed the cognitive levels of 36 adults ranging from 16 to 80 years of age using the Mini Mental State Examination (MMSE), which concluded that the patients presented with various forms of mental impairments. The patients were also said to be deficient in vitamin B12 and received supplementation in the form of 1mg weekly for 3 months. The results concluded that after the injections, 47.2% of the patients showed cognitive improvement (Kalita & Misra, 2008). Although this research consists of adult participants, understanding how crucial B12 is for adult cognition can lead researchers to recommend serving this vitamin to children, as well.

Vitamin D

People living in countries that receive less sunlight have been found to be vitamin D deficient and are more likely to experience rickets in infancy, the formation of autoimmune diseases, and if left untreated, various types of cancers as well (Genuis, Schwalfenberg, Hiltz, & Vaselenak, 2009, Abdul-Razzak, Ajlony, Khoursheed & Obeidat, 2011). When vitamin D is not readily available for a growing body, adverse effects can be seen, but when reintroduced into the diet, improvement in health can be witnessed.

While the relationship between vitamin D and brain function is still being explored, and much of the research is focused on adults rather than children, researchers are uncovering possible adverse cognitive effects that can occur as a result of a deficiency (Latimer et al., 2014). A meta-analysis of six studies reviewed the effect of vitamin D concentration on the likelihood of being diagnosed with dementia. This analysis determined that, in five out of the six studies, those with severe vitamin D deficiency had a significantly increased risk of developing dementia when compared to those with sufficient levels of vitamin D. The authors assert that this increased risk of dementia from vitamin D deficiency may be attributed to the fact that vitamin D works similarly to neurosteroids in the brain, including the regulation of calcium levels and potentially protecting against neurodegenerative processes which are associated with cognitive decline seen in dementia (Sommer et al., 2017).

Cognitive effects related to the amount of vitamin D present in the body are seen in studies utilizing rats as well as humans. Researchers utilized rodents in order to model human vitamin D levels as either deficient or sufficient and tested whether increasing vitamin D levels could maintain or improve cognitive function in rodents during middle age. Compared with low or normal vitamin D groups, only aging rats with higher vitamin D levels could successfully carry out a complex memory task and had blood levels considered in the optimal range (Latimer et al., 2014). These results suggest that vitamin D may improve the likelihood of healthy cognitive aging. Further, studies on rodents have linked vitamin D to the regrowth and protection of nerves to improve cognitive aging. Research found that the application of vitamin D for 48 hours on rodent embryo brain cultures prevents cell damage in the hippocampal neurons and the cortical neurons of the brain when compared to cultures not provided with vitamin D (Chabas et al., 2013; Gezen-Ak, Dursun, & Yilmazer, 2014), which suggests that the presence of the serum to the culture worked as a protective agent. Although little is known about the effects of vitamin D deficiency on children, the research described above detailing the repercussions of vitamin D deficiency in adults and rodents, suggests that there may be a similar impact on children's development.

Vitamin C

Vitamin C has also been found to be crucial in a healthy diet. A review of the effects of vitamin C on the brain found that vitamin C reduces oxidants in the brain and ultimately protects against lesions forming. Vitamin C is also a natural

regulator for neurotransmitters such as dopamine and norepinephrine, thus, a deficiency could lead to neurological impairment (Tveden-Nyborg & Lykkesfeldt, 2009). Vitamin C has been linked to the prevention of respiratory tract infections (RTI) in children. Garaiova et al.(2015) examined the body's response to vitamin C when exposed to RTI in preschool settings. The research found that when the children were regularly given a probiotic with vitamin C supplementation, they displayed fewer symptoms when contracting a RTI and recovered more rapidly, when compared to children who were given a placebo or a probiotic alone, thus furthering the evidence that vitamins in a young child's diet are crucial for health and development (Garaiova et al., 2015). It has been noted that if an unhealthy diet is recognized early after birth, health problems are likely to be prevented through the appropriate amendments to dietary habits that can carry into adulthood (Kourlaba, Kondaki, Grammatikaki, Roma-Giannikou, & Manios, 2009). It remains important that parents of young children pay close attention to types of foods their children consume.

Macro Nutrients

In addition to vitamins, macro nutrients (fats, carbohydrates, proteins) are known to be essential for optimal brain functioning and maintaining mental health. Although there is debate as to the ratio within which these macro nutrients should be consumed, it is understood that all three are necessary in a healthy diet.

Proteins

Proteins, while widely understood to aid in muscle development and physical functioning, are also key in terms of brain functioning. Proteins are comprised of amino acids, which are the building blocks of protein and essential in the production of neurotransmitters such as norepinephrine, melatonin, and serotonin (Bourre, 2006). A study of teenagers aimed to reveal if afternoon snacks comprised of mostly protein are more beneficial for overall diet health when compared to a snack of mostly fat or no afternoon snack at all.

Researchers provided participants with a pudding snack comprised of the randomly assigned target macronutrient and on the 4th day of each snack time, participants received an fMRI, cognitive performance assessment, and an assessment of appetite and mood prior to the snack and after the snack. In addition to appetite control, snacks high in protein tended to reduce confusion-bewilderment and increase cognitive flexibility. The study found an increase in processing speed on the cognitive assessment after the high protein snack and an increase in cognitive flexibility (Leidy et al., 2015). Another study tested 18 healthy young adults by having them consume a drink containing either protein, fat, or glucose. The groups were then asked to complete various cognitive tasks 15 minutes after consumption and then again 60 minutes after consumption. The study found that after consumption of the protein drink, working memory performance and episodic memory increased at the 15-minute trial, as well as the 60-minute trial, when compared to participants who consumed drinks

comprised of fats and glucose; although participants who drank glucose did show an increase in mental clarity (Jones, Sünram-Lea, & Wesnes, 2012).

Carbohydrates

In addition to proteins and amino acids, carbohydrates play a role in cognition. Glucose, which is a form of carbohydrate, is the main energy source for the brain, which requires about 20% of total glucose energy consumed for functioning (Sokoloff, 1999). When looking into non-memory cognitive tasks, carbohydrates have been shown to improve cognitive abilities, though glucose may be a contributing factor as well. A study from Allen et al. (1996) tested 28 healthy older adults (who had an average age of 73) with various tasks such as dichotic listening, Rey/Taylor Copy and Recall, figural fluency, and verbal fluency 15 minutes after being given a drink containing 50mg of glucose. The following day the participants were given a drink containing saccharin, an artificial sweetener (instead of glucose) and tested as they were on day one. Consuming the glucose drink was related to improved verbal and figural fluency in participants, but not improvement on the recall test, indicating that glucose may selectively enhance certain cognitive functions. Further review has found that induced hypoglycemia (low blood sugar) in normal subjects and in patients with type 1 results in diabetes and visual and auditory information processing deficits. In addition, glucose consumption prior to cognitive testing, enhances the ability to perform certain recall tasks when compared to ingesting fats prior to tasks (Dye et al., 2000), These findings show the benefits carbohydrates can have on

cognition in fully developed adults, and although a study like this has not been implemented on children, results provide insight as to the possible benefits that may come from children's regular carbohydrate consumption for brain development.

Fats

It is said that when dry, 60% of the brain is comprised of the long-chain omega fatty acids DHA and EPA, which are essential to the formation of gray matter, the central nervous system, and cognitive performance (Benton, 2010; Nyaradi et al., 2013). Stonehouse et al. (2013) concluded that DHA supplementation over a 6-month time span improved overall memory and reaction times in adults between the ages of 18-45 years with low DHA. It has also been found that consuming long-chain omega fatty acids during pregnancy is related to children's language development. 7421 children whose mothers consumed fish 1-3 times weekly during pregnancy were assessed at 15 months and showed elevated scores for language comprehension (Daniels, Longnecker, Rowland, Golding, & Health, 2004). There is evidence that when a DHA deficiency is present during periods of brain development, plasticity and brain function can be impaired in adulthood leading researchers to believe that adequate levels of dietary DHA seem crucial for building long-term neural resilience for optimal brain performance (Bhatia et al., 2011).

Overall, there is extensive research to support the idea that the foods humans consume contain essential nutrients for brain development and

cognition, and without these nutrients, functioning and human development may ultimately become inhibited. While some of the research focusing on the impact of calories, vitamins and macro nutrients uses adult samples, it is likely that these dietary elements are important components of a healthy diet for young children, as well as adults. Additionally, as it was noted that children are not receiving adequate nutrition, it is important to educate parents so that they can feed their children well and teach them nutritional habits that they can carry forward into adulthood. When children understand the importance of good nutrition and develop healthy habits early in life, they are more likely to implement these habits when they become adults.

What Children Understand about Nutrition

Dietary habits are established early in life, making young children an important target for nutrition education (Carraway-Stage et al., 2014). Ensuring that children are properly informed early on can greatly impact how they will eat and the food choices they will make later in life. When teaching children nutrition in the home, it is important to understand what knowledge they have already acquired and where this knowledge is stemming from; this allows a baseline from which parents can begin building knowledge with their children. For example, Slaughter and Ting (2010) interviewed children as young as kindergarten to gauge their understanding of nutrition and discovered that children 5 years and older expressed a general understanding that fruits and vegetables are needed to help the body grow and maintain health. It was also found, though, that

children held misconceptions regarding health and nutrition, conveying a lack of understanding for more abstract terms like “diet” and ingredients that are often added to foods. As children begin to develop cognitively, their understanding about food and nutrition begins to advance. Fifty two children were assessed on food and nutrition comprehension and it was apparent that changes in food and nutrition knowledge are amassed between preschool and 2nd grade, with 2nd grade students having considerably more knowledge compared to preschool students (Xu & Jones, 2016). Xu and Jones (2016) explained that this growth in nutrition knowledge can be in part attributed to the idea that as children age, their ability to think more complexly and form mental representations is strengthened which helps their ability to understand nutritional information. Similarly, when older children between the ages of 7-13 years of age were assessed on food knowledge and how social perception affects eating habits, studies found that children ages 7-8 years had less food knowledge when compared to the oldest group, who were 11-13 years old (Tarabashkina, Quester, & Crouch, 2016). Interestingly, the study also revealed that despite the findings that more accurate nutrition knowledge comes with age, there is also greater pressure from peers and the media to eat in a way that builds social standing or makes children feel more accepted by peers which may or may not support healthy eating. The idea that children’s understanding of health is influenced by societal views can be seen in an interview where children as young as 10 years old and into adolescence were asked about their perceptions of health and diet, as well as

their parents. Results found that children thought that the terms “obesity” and “overweight” correlated with being unhealthy and less socially acceptable, which was a factor as to why they felt weight was of importance (Thomas, Olds, Pettigrew, Randle, & Lewis, 2014). In summary, the studies described above illustrate how child knowledge of food and health changes as children grow into adolescence and how their knowledge base becomes more complex and highlight the importance of both targeting food and nutrition information to children’s developmental skills and starting the education process early in life.

Influences on Children’s Nutrition Knowledge

Children develop their ideas about nutrition from a variety of sources including parents, schools, and the media. When factors related to healthy diet and nutrition are inaccurately conveyed by parents, schools, or the media, children may experience adverse effects or may begin to develop schemas about food and nutrition that are inaccurate (Mrdjenovic & Levitsky, 2005).

Parental Influences

Parents greatly impact a child’s knowledge of the world; they can be a strong positive influence or, conversely, a powerful negative influence. Because parents can be a strong influence on a child, it is important that parents provide their children with knowledge about nutrition and instilling healthy eating habits early on (Adamo & Brett, 2014). While parents may have the best intentions in terms of healthy eating, they are not always aware of specific issues that are

important to convey to their children, such as what vitamins are crucial in a diet and what foods cause excessive weight gain.

Parents exhibit behaviors that children observe and follow. A study by Brown and Ogden (2004) assessed the impact parents had by surveying 112 pairs of parents and children ranging from 5 to 12 years of age regarding their personal eating habits. The children and parents were given identical surveys and asked to respond. The results concluded that children's eating behaviors and attitudes closely corresponded to those of their parents when surveys were compared side by side. Moreover, Brown and Ogden (2004) noted that parental dietary habits (both good and bad) were reflected in children's self-reported eating habits showing the strong impact parents have on their children. Another study by Draxten, Fulkerson, Friend, Flattum, and Schow (2014) examined the connection between parent consumption of fruits and vegetables during mealtimes and children's fruit and vegetable consumption. Results found that 23% of the children were receiving the recommended level of fruits and vegetables and that these were the children whose parents were most likely to exhibit good eating habits, showing parents can be a positive influence when demonstrating which foods are important in a diet. Not having health and nutrition information also influences a child's eating. Research studies have found that many parents are ill informed about recommended meal sizing; a meal that is not proportioned properly, even if foods are healthy, can cause adverse effects on the child's weight and general knowledge of how much to eat (Adamo & Brett,

2014). A study conducted by Mrdjenovic and Levitsky (2005) on parent portioning concluded that the largest determinant of the amount of food consumed by children was the quantity of the food served by the parents. When parents are not aware that portion sizing matters, children are more likely be unaware as well, leading to potential bad habits later in life.

Another factor that influences children beyond parent misinformation is parental warmth. Parents who are engaging children in a warm and welcoming manner during meal-time can positively impact the child's eating behavior. A study by Xu, Wen, Rissel, Flood, and Baur (2013) found that the way in which parents engage with children while eating can impact food choices. This study examined parent emotional input for mothers of two-year-olds. Six hundred sixty seven first time mothers were included in the study; their parenting was assessed as either hostile or warm toward their child during feeding time. Levels of self-efficacy were also observed. The results revealed that parents who felt confident about feeding and exhibited a warm demeanor toward their child had children who ate fruits and vegetables more frequently. Conversely, when parents showed more hostility there was an increase in soft drink and snack consumption (Xu et al., 2013).

In summary, parents can impact what their children understand about a healthy diet and are a large influence as to what types of foods children consume. If parents understand what is important nutritionally, this

understanding can be passed down to children (Peters, Parletta, Campbell, & Lynch, 2014).

Media Influences

The media, like parents, impacts how children view eating, food choices, and what is considered healthy nutrition habits. Media such as television reaches children at a young age, often before they are exposed to more organized educational settings. This provides an opportunity for media to begin teaching and influencing children before they enter school (Huston & Wright, 1998).

Research studies have shown that media can negatively influence eating habits, but it can also be used as a tool to inform and educate children, allowing them to learn from media sources such as television, movies, music, or packaging labels. Habib and Soliman (2015) suggest various forms of media could be used as a tool to aid parents in their efforts to help their children develop healthier habits. For example, their article reviewed the effect cartoons have on children who are consistent viewers and highlighted how a cartoon could be used to teach a child how to control their temper, obey their parents and speak in a polite way. Studies such as this suggest that the media could be helpful in teaching children to alter behaviors such as poor eating habits and aid in instilling nutrition information.

Unfortunately, the media sometimes influences children's eating habits in more negative ways. For instance, Kotler et al. (2013) found that children are more likely to want to eat a food if they view a familiar television character eating the same food. The study compared children's desire for healthy snacks

packaged with a familiar character to junk food snacks packaged with the same familiar character. Results found that junk food snacks are more appealing when shown with a familiar character as compared to healthy snacks shown with the same familiar character. Interestingly though, when a healthy snack is paired with a familiar character versus an unfamiliar character, the healthy snack paired with the familiar character will be favored by the child. Priming is a powerful tool that can be used to influence children to engage in healthy eating. Research from Wansink, Shimizu, and Camps (2012) looked at children's lunch choices over 4 weeks before and after the children were shown Batman with a healthy choice and an unknown penguin character with French-fries. Before the priming, more children chose French-fries with their lunch, however, after being shown images of the characters paired with the foods, more children chose the healthy snack they viewed Batman eating. These results further support the idea that having favored characters on healthy food labels will aid parents in teaching about nutrition and ensuring healthy food choices. With the knowledge gained from this, parents can then begin to explain to children how the healthy eating habits of their favorite character helps the character and how the child can benefit in the same way.

As noted above, although the media has the potential to teach children healthy forms of diet and nutrition, research repeatedly demonstrates that the media is influencing children in a way that aids in snack and sweets sales and, in turn, places pressure on parents to purchase unhealthy foods. Research shows

that the media can impact what children eat as well as their parents. A study from Harrison and Peralta (2015) was conducted on parents and preschool aged children living in food secure homes to find a connection between food media commercials and the prevalence of fatty foods in the diet. The results from the study concluded that television commercial viewing had a direct correlation with child intake of fatty, calorie dense foods, which led the researchers to believe that if parents have the means to spend on the foods their children see advertised, they are more likely to do so when funds are readily available to them (Harrison & Peralta, 2015). This study highlights the persuasiveness of media messages and how parents need to be aware of how much control media asserts over their spending habits. Food packaging presents a similar issue. Taghavi and Seyedsalehi (2015) followed 600 children and assessed them using questionnaires provided to parents. Parents were asked to report on how much their children are influenced by food package advertising and how likely they are to give into their child's desires. Results showed that attractive packaging influenced 62% of the children, who in turn influenced their parents to buy the item. Additionally, a study by Chernin (2008) found that children aged 5 to 11 specifically requested to have products that were shown repeatedly on television.

These studies show the impact the media has on children's nutrition and healthy eating habits. The media is a powerful influence that can be a deterrent to parent's efforts to encourage healthy eating habits and may cause parents to feel pressured by their child.

School Influences

Depending on the school system, children may spend a large portion of their day in a school setting where meals are provided for them and where nutrition may be taught or modeled by teachers, leaving many students to learn about meal and nutrition habits from what they are exposed to at school by educators (Eliassen, 2011; Savage, Fisher, & Birch, 2007). What is troublesome about the fact that much of children's nutrition knowledge may come from school, is that many teachers do not provide good models or actively teach good nutrition habits. For example, Khraofa and colleagues (Kharofa, Kalkwarf Khoury, & Copeland, 2016) found that in the child centers they studied in the U.S., only 12% of teachers were actively sitting with children at mealtimes and modeling a family style meal, and only 29% were modeling healthy meal habits to children, leaving the children with little helpful knowledge that could be taken away from the centers' mealtime experience. Happily, of the 12% of centers who did share in a family style mealtime, children were more likely to consume fruits and vegetables, as compared to the centers not actively displaying family style mealtime (Kharofa et al., 2016). This demonstrates that teachers can impact what children know about nutrition and eating habits, and that healthy nutrition practices are crucial in the school setting.

Schools have a responsibility to provide students with an informed and accurate concept of what a healthy diet looks like (Eliassen, 2011). This is true no matter the age of the students. Research on Canadian University students

examined the nutritional knowledge and habits of prospective high school teachers and found that although teachers showed an understanding of the importance of nutrient rich foods, 65% reported contradictory eating habits and consumed a diet high in fats, and two thirds of the respondents were said to be likely to eat from a vending machine or reward students with candy in the school setting (Rossiter, Glanville, Taylor, & Blum, 2007). Similar results were seen among middle school teachers in the United States. Four hundred and ninety middle school teachers were surveyed on their beliefs about school nutrition as well as their own nutrition. The surveys concluded that 69% of teachers felt schools should not allow candy or sweets to be purchased on campus; however, 73% of the teachers reported giving out candy to students in class as rewards or incentives. Survey results also concluded that although most teachers had high fat diets, 93% believed themselves to be in good health (Kubik, Lytle, Hannan, Story, & Perry, 2002).

Although the school influence can be negative, when a nutritional program is set in place, children can be positively impacted. Over the course of 8 weeks (Drapeau et al., 2016), a health and nutrition program was implemented with 404 fifth and sixth grade elementary school students. Children were placed on one of two teams: a control group and an intervention group who received the nutrition intervention program. After the 8 week program concluded, a follow up was done for weeks 9 and 10. The results from the study proved that the intervention group of students consumed a larger amount of fruits and vegetables during the

10 week span compared to students in the control group. More evidence pointing to the positive influence of child nutrition interventions can be seen in research by Prelip, Slusser, Thai, Kinsler, and Erausquin (2011) who aimed to find a method to increase fruit and vegetable consumption in urban schools and to offset high calorie, nutrient-void foods consumed by children. The nine month nutritional eating overhaul program tested the children on fruit and vegetable consumption before beginning the program, and then again after the program had finished and obtained significant findings furthering the idea that child nutrition programs can ultimately increase a child's consumption of healthy foods. These studies suggest that the school system can impact students' eating and nutrition habits in a positive manner if thoughtful intervention programs are implemented.

In summary, it is important to consider the role of schools in children's healthy diet and as a source of nutrition knowledge as children spend considerable time in schools and since it has been shown that school influences are impactful. Both teacher knowledge and attitudes, as well as school practices related to nutrition, are contributing factors.

Parent Education Strategies

Ultimately, the key to healthy eating across the lifespan is for parents to be educated and promote healthy eating habits. As noted above, parents need to attend to healthy eating while pregnant and continue to eat healthy foods and educate their children throughout childhood. Parents also need to understand

contexts outside of the home that influence their children's nutrition and health.

The best way to do this is by helping parents build a strong knowledge base and combat the three main areas of influence mentioned above: family, media, and school.

Educating Parents on Building Nutrition at Home

Instilling knowledge of healthy habits at an early age is of great importance for children, especially when research shows that as children age, they become less influenced by parental advice on diet and nutrition and lean more toward peer influences (Adamo & Brett, 2014). Therefore, it is vital that children have internalized the knowledge and skills necessary for maintaining their own health early on. However, this is difficult if parents don't understand the importance of healthy eating, especially young children. Educating parents on what a healthy diet looks like can provide parents with the skills needed to provide children with healthy eating environments and pass along knowledge about healthy eating habits to the child through active parent involvement. This transmission of knowledge ultimately helps children to gain the nutrition they need in order to develop optimally (Draxten et al., 2014).

When looking at common nutritional knowledge among parents, it is often reported that although parents lack knowledge in more specific areas, a large number of parents are aware of basic things such as the fact that snack foods are not beneficial and that fruits and vegetables are important (Pescud, Pettigrew, & Henley, 2014). Increasing a parent's knowledge base to include

more specific information is a key strategy to building healthy eaters. The more knowledge parents have, the more knowledge they can pass on. A study found a positive direct association between parent understanding of nutritional knowledge and the amount of nutrient-rich food found in their home readily available for children to eat (Campbell et al, 2013). The study also found that when parents were knowledgeable about food nutrition, there were fewer snack foods present in the home (Campbell et al, 2013). Parents who have a strong knowledge base will benefit children because they are more likely to feed their children a nutrient rich diet and to transmit important information as compared to parents who are not aware of what is beneficial for a child or may have obtained misinformation about the nutritional value of food (Pescud, Pettigrew, & Henley, 2014). Taylor, Gallagher, and McCullough (2004) found that many parents are feeding their children diets low in iron. The study found that parents were not fully informed about the importance of a diet rich in iron and that many parents encouraged dietary habits that could lead to iron deficiencies. When parents are unsure of how to help their children form healthy habits or are not aware of what diet and nutrition looks like, children are likely to be unaware as well (Pescud, Pettigrew, & Henley, 2014).

Another vital strategy important to building healthy eaters is becoming a positive role model in the child's life. When parents model eating strategies, either positive or negative, children will likely imitate. By becoming a positive role model for children, the parent is utilizing a tool that can impact the child's ideas

on health and their future eating habits. A review by Scaglioni, Salvioni, and Galimberti (2008) explains the effects of parental feeding attitudes and styles on children, highlighting the benefit of the parent being a positive role model. The review classified a positive role model as one who believes that children should do as parents do, rather than what they say, and concluded that modeling may produce larger benefits to feeding and health knowledge than parental restrictions on food consumption and pressuring children to eat certain foods.

Parent involvement is a crucial tool for helping children as they develop the idea that foods are important to consume. It is important to teach parents ways to get children excited about food preparation and healthy eating. This type of involvement can help children form patterns that carry forward. A survey conducted by Williams, Veitch, and Ball (2011) examined the various methods parents use when attempting to build educated eaters. Parents and children of healthy weight were asked about their views of parental influence on healthy eating at home. Healthy weight children reported that their parents communicated openly about healthy eating and provided boundaries about food intake. Parents of healthy weight children talked to their children about why boundaries must be set and the benefits of a healthy diet. Families who are actively involved in meal-time, through time spent together and conversation, have children who are less likely to develop weight issues. When looking at the results of a study from Rollins, Francis, and BeLue (2007) involving 11,000 children ranging from 4-9 years old, researchers found that nearly one third of the

children were overweight and those who were reported to be overweight also reported fewer family meals eaten together per week. The study concluded there may be a connection to a child's healthy weight and the amount of time spent weekly eating as a family (Rollins, Francis, & BeLue, 2007). Research studies also indicate the importance of cooking together as a family. A study by Kim (2018) focused on young children aged 3-5 years and their parents who participated in a 7-week nutrition education program to educate preschoolers on nutrition as well as help build a stronger parent-child relationship through cooking with one another. The program was a family-focused child-parent cooking class which taught families about foods, recipes, cooking techniques, and positive parenting strategies. After seven weeks most parents reported their child had a greater willingness to try healthy foods, and 85% of children were cooking with their parents in the home more often than they had previously (Kim, 2018). Another study conducted on roughly 2,100 adolescents found that those who frequently cooked with a parent had a higher consumption of fruits and vegetables. The study also revealed that among those involved, adolescents who cooked not just for themselves but also for others in the household showed healthier diets and improved eating patterns (Berge, MacLehose, Larson, Laska, & Neumark-Sztainer, 2016). Vander Horst, Ferrage, and Rytz (2014) examined 47 children between 6-10 years of age and their parents. Parents were either instructed to cook for the child or cook a meal with the child. The results from the study found that children who cooked with their parents were more likely to

consume vegetables and chicken when compared to children who did not engage in cooking the meal. This suggests that allowing children to become involved in the meal preparation process may prove to be beneficial in teaching children healthier eating habits. Engaging children in cooking with their family may help children to make healthy eating choices later in life and outside the home environment.

In summary, it is important to teach parents about elements of a healthy diet and good nutrition habits, the importance of modeling good nutrition habits to their children, and parent involvement through family mealtimes, conversation about healthy habits, and cooking together as a family, as these factors are important to children's healthy nutrition habits and development.

Educating Parents to Overcome Media Influence

Parents impact what their children consume, but positive parent messages can be undone by the media. It is important to teach parents to implement various tools when combatting media messages to aid their children in understanding the importance of a healthy diet. Velardo and Drummond (2013) surveyed 14 parents of children younger than school age regarding their child's diet and nutrition and the impact media plays. The results showed that parents felt that they were battling against their children's desire for high-calorie, low-nutrient foods (i.e., fast foods) and that their children were heavily influenced by television commercials. A survey of 318 parents found that the majority believed that there were too many food advertisements targeted toward children and that

TV food ads encourage unhealthy eating. Although the mothers in this study believed media negatively influences children's eating habits, they also felt media was not the most influential aspect of their children's choices and that parents can guide children away from negative influences (Yu, 2012). Research studies suggest that parents can minimize media influence on their children's diet by setting restrictions on media as well as specific foods. Turning off the television or setting limits on what a child can or cannot watch may help parents. Kent and Wanless (2014) found that children are heavily bombarded with snack commercials on children's television stations. Thus, encouraging parents to set restrictions on amount of TV watched, as well as channel and programming type, may combat snack food marketing. Another way to influence children's eating habits is by restricting media during the day and during mealtimes. Multiple studies have found that eating together is a way to increase healthy eating habits and decrease obesity (Berge, Wickel, & Doherty, 2012; Fiese, Hammons, & Grigsby-Toussaint, 2012).

Educating Parents on School Nutrition Programs

When parents are aware of the importance of nutrition education at school, they can work with their children's teachers to introduce such programs or talk with their children about programs that are already being offered. School-based nutrition intervention programs positively impact attitudes and eating behaviors in children (Drapeau, Savard, Gallant, Nadeau, & Gagnon, 2016). Children's behaviors are influenced by their surrounding environment, and for

many children, their daily environment is a school setting. Therefore, schools can play a vital role in building a platform for nutrition education and promoting healthy behaviors (King & Ling, 2015). A longitudinal study by King and Ling (2015) examined the effects of a nutrition and physical education development program to promote health for children and families in low-socioeconomic status elementary schools on 999 K-3rd grade students. Data included pedometer tracking and asking participants to recall previous-day fruit and vegetable consumption over the course of three years. The nutrition development program offered nutrition workshops to parents and teachers, provided more fruits and vegetables in children's school meals and offered physical activity opportunities for children outside of the school setting. Results indicated that over the 3 years, children's nutrition and physical activity increased significantly in both boys and girls. These results demonstrate that school-based programs are a vital component in providing children with nutrition education.

Closing Thoughts

The type of diet a child receives early in life can impact their immediate and future health. Children observe and learn eating habits from the environment they are placed in, making it important to teach children healthy eating habits from early on. Parents play an important role in educating children in healthy eating and better developing an understanding of what foods are most beneficial for a growing mind and body. While children may learn food and nutrition information from places such as school and the media, parents remain the main

influence in the food choices a child makes, and in their children's overall nutritional health. Because of the impact parents make on a child's understanding of health and nutrition, it is of great benefit for parents to be well equipped with food and nutrition knowledge, as well as the role healthy eating plays in a child's development. Additionally, parents need tools for how to manage media and school influences on their children's health and development.

Existing Nutritional Education Programs

There are parent education programs that aim to help parents navigate the topic of nutrition and healthy eating with their children. These include a nutrition intervention program where elementary school age children were given multiple brief instructional lessons on physical and nutritional education over the course of seven months, while parents were given physical and health education flyers and invited to learn more on the topics at school functions (Katz, et. al., 2011) and a nutrition intervention through Women, Infants, and Children (WIC) where clients attended group meetings every two months and met with a nutritionist every six months in a yearlong program with the goal of educating parents about nutrition (McGavey, et. al., 2004). Although each of these programs led to some change on the part of participants, the change was not dramatic. Katz and colleagues found that children and parents were better able to understand food ingredients and read food labels, but that their nutrition eating habits showed no significant improvement. McGavey and colleagues reported change, on average, in one food related behavior and one activity related

behavior, but did not note additional significant changes in parent behavior or children's health. While these efforts are important, they are missing elements that might influence their effectiveness such as the inclusion of parents, the intensity of parent inclusion, and the timing of parent inclusion.

In looking at the interventions provided there are several limitations that may have limited their impact on parents and children. For instance, interventions that focus on tracking children's health and nutrition do not target parents as participants as well but rather as more of a guide. Parents who are also participating along with children may be a helpful tool in influencing children's nutrition habits. As mentioned earlier, when discussing school influences on child nutrition, many schools implement programs geared toward children who are taught the importance of healthy food and physical activity for a specific duration and are asked to report on their diet and activity levels before and after the program. This type of intervention does not aim to educate parents who are essentially teachers to children, but instead rely on the idea that the children will take in the education and practice what was learned at home on their own. By including the parents in the intervention and providing them with tools needed to teach their children, the children will be able to be continually reminded of the knowledge as the parent continually models and ideally applies the knowledge they have gained.

With regard to nutrition and health interventions aimed toward children and parents, parents often do not receive the same intensity of intervention as

their children do. For example, the intervention program conducted by Katz, mentioned above, provided brief instructional lessons on physical and nutritional education over the course of seven months to elementary school age children while parents were given physical and health education flyers and invited to learn more about these topics at school functions. Although children and parents had a better understanding of food ingredients and how to read food labels after the intervention, their nutrition eating habits showed no significant improvement (Katz et al., 2011). Had parents been given the knowledge via an instructor as the children did, they might have been able to better retain the information. Also, if parents were given the mandatory instructor interaction the children were provided with, they may have been more likely to ask questions and engage with what they were learning; helping to take in the information and model to their children in the future.

As noted above, an intervention by McGavey et al., (2004) provided a nutrition supplement program through Women, Infants and Children (WIC). The program goal was to educate parents on nutrition to ultimately prevent child obesity. The WIC clients attended group meetings every two months and met with a nutritionist every six months in a yearlong program. After the study concluded clients reported, on average, a change in one food related behavior and one activity related behavior when parenting. A strength of this program was that it provided access to meeting with a nutritionist and participation in group meetings. However, the length of time between group meetings was every two

months which might have had a negative impact on how well parents retained the information. If parents are given frequent sessions, they may be able to keep information fresh in their minds, creating a greater likelihood that the information will be applied in daily settings.

Purpose

The purpose of this project is to create a parent education program that educates parents on the impact of healthy nutrition on children's cognitive functioning, the role of parent practices and attitudes on children's healthy eating, and about the myriad influences on young children's healthy eating. In addition, this program seeks to ameliorate things lacking in previous parent education programs, such as providing a direct, intensive intervention to parents, to maximize impact on parents and perhaps, in turn, children. Specifically, this project presented information sessions to parents to educate them further about these important topics through weekly online workshops.

CHAPTER TWO

METHODS

Overview

Parent information sessions highlighted the following topics: cognitive growth in the first 5 years of life, the impact foods make on a diet and which are best for consumption, the importance of parent input and modeling on a child's diet, and other influences on diet and nutrition such as media, peers, and school programs. Parents who agreed to participate followed a link provided to them which allowed access to online workshops. In total, parents participated in four one-hour sessions pertaining to the topics described above. Session information was presented twice a week for the length of one hour each session where a new topic is covered each time. Prior to the first session, parents completed a brief online survey regarding their thoughts on diet, their child's diet, and their general health knowledge. After the program was completed (or when parents had participated in all four online sessions), parents filled out a second online survey to gauge growth in parent cognitive and nutritional awareness. Table 1 displays the sessions by number and topics with a description of each.

Table 1. Outline of Sessions

Session	Topics
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Session 1	Pre-session survey What is cognitive development? Why is nutrition important to children?
Session 2	The impact of nutrition on the brain Which nutrients are helpful? Healthy foods to eat and where to buy them
Session 3	Parent influences on nutrition Role models Need for involvement Teachers
Session 4	Media persuasion What children learn from school Peer influences Post session survey

Participants

The participants in this project included five parents ranging in age from 18 to 39 years of age. There were three female participants (60%) and two male (40%) participants. Four of the participants identified as Caucasian and one participant identified as Hispanic. As seen in Table 2, participants were also asked to provide information about their current occupation, which role best describes their current role as a parent/ guardian or caregiver, and the highest level of education they have completed.

Table 2. Demographic Questions

	Current Occupation	Current Role	Highest Level of Education
P1	Pharmacy Technician	Parent	Some college
P2	Stay at home parent	Parent/Caregiver	High School
P3	Administrative Assistant	Parent	Some college
P4	Technical Consultant	Parent	Some college
P5	Warehouse Manager	Parent	Some college

Development of Project Materials

The parent workshop developed for this project consisted of 4 sessions each focused on a specific nutrition related topic. The topics included: 1) An Introduction to Child and Nutritional Knowledge, 2) Developing Optimal Child Cognition through Diet, 3) The Parent Role in Nutrition, and 4) Outside Influences on Nutrition. Additional details about the content of each session are provided below. Sessions incorporated open discussion with participants by having them type into a chat window on their screen. Sessions were delivered through Zoom, but rather than seeing others faces on the screen, participants saw Powerpoint slides and listened as the information on the screen was being discussed. (See Appendix C).

Introduction to Child Nutrition Knowledge (Session 1)

This session began with an introduction regarding the importance of nutrition for a growing mind and the impact diet can have on children's development. The intention of the first session was to convey how healthy eating early in life can help with physical and mental development, as well as explain why it is crucial to teach young children about nutrition through parent modeling, as it is a key influence in the development of the brain (Nyaradi et al., 2013). In order to gauge participant understanding on child nutrition and general nutrition knowledge, the pre-workshop survey was administered prior to the delivery of the session.

Developing Good Nutrition (Session 2)

Session 2 began by explaining the impact foods have on brain function by discussing specific nutrients in detail. The goal was to build an understanding of how nutrients can improve brain development as pre-school children are particularly vulnerable to nutritional deficiencies. These deficiencies make it vital that parents are informed about appropriate diets for their children (Taylor, Gallagher, & McCullough, 2004). To better convey how nutrients can be provided, food groups were discussed, and examples of ideal foods were listed; additionally, with locations where food types can be purchased was included. This information was used to direct participants regarding what foods to buy specifically why these foods are important for children, and the possible issues that can arise in cognitive development if these foods are lacking.

Parent Role in Nutrition (Session 3)

This session provided information on how parents impact a child's nutrition through modeling behavior, parental involvement, and serving as a knowledge provider. Participants gained a better understanding of how influential they are to children as well as how children can potentially benefit from this influence. Parents are a large determinant of the amount of food children consume because portion size is learned from what parents serve. When parents are not aware that portion sizing matters, children are more likely to be unaware as well, demonstrating the influence of parental modeling (Mrdjenovic and Levitsky, 2005). Strategies on modeling and parent input were discussed.

Outside Influences on Nutrition (Session 4)

There are outside sources that can potentially be just as influential as parents. Given this it is important for parents to understand how children are being targeted by influences such as media (e.g., food and drink advertisements) and what strategies parents can implement to combat this. In addition to media, this session discussed the influence schools have on a child's eating habits and how school nutrition programs may benefit a child. This session also covered how peers may impact a child's eating choices, as well as provided strategies parents can use to handle a situation where a child is being pressured or influenced by a peer. The post session survey was completed by participants at the end of this session.

Procedure

Participants were recruited through a preschool center located in Corona, California. Flyers were made visible and obtainable in the main office of the center. Those interested were able to take a flyer home and were asked to respond via email to an address provided on the flyer. After participants gave email permission to participate, they were sent information on how and when to log on to the website in order to participate in the sessions. Participants were also emailed links that instructed them about where to go to complete the online pre and post workshop surveys.

Measures

Pre-Session Survey

Six demographic questions were administered, as well as a self-created survey of participant's views on nutrition topics. Participants were asked to complete this survey prior to the presentation of the first online workshop. The results from the pre-session survey were not analyzed prior to the workshop as they were used for information and comparative purposes after the post-session survey had been completed. The purpose of the self-created survey and demographic questions was to gauge what participants understood about health and nutrition, as well as what they hoped to learn from the sessions. Specifically, this survey included two open-ended questions pertaining to what participants hoped to learn from the sessions and seven questions designed to gauge parent understanding of health and nutrition. These seven questions were rated on a 5-

point scale where 5=strongly agree, 4=agree, 3=neutral 2=disagree, and 1=strongly disagree. (See Appendix A).

Post-Session Survey

Once the last workshop session was made available online, a survey created by the researcher was presented to participants, which included questions from the pre-session survey as well as additional questions included only on the post-session survey. This survey helped to determine if participants better understood general child health and nutrition after completing the sessions. Participants also provided feedback regarding the sessions and the information provided. Specifically, this survey included the same seven Likert scale questions given on the pre-session survey (rated on the 5-point scales described above) and seven additional questions asking participants to provide feedback about the four sessions they attended. Three of these 7 post-session questions required open-ended answers and four were rated on a 5-point scale where 5=very likely/useful, 4= likely/useful, 3=neutral 2=unlikely/not useful, and 1=very unlikely/very not useful. (See Appendix B).

CHAPTER THREE

RESULTS

The purpose of this project was to educate parents about the impact of healthy nutrition on children's cognitive functioning, as well as to raise awareness about the various factors that impact children's eating and healthy nutrition. The information sessions were designed to highlight topics of child nutrition and cognitive functioning including; the development of cognition in the first 5 years of life, the way in which diet and development are impacted by food and which foods are best to eat, the importance of parent input and modeling on a child's diet, and other influences on diet and nutrition such as media, peers, and school programs. The goal of the information sessions was to help parents gain knowledge on these topics, along with increasing their confidence in presenting food and health nutrition information to their children.

Pre-Session Survey

Prior to the sessions, participants rated their own ability to encourage healthy nutrition and eating in their children and their understanding of influences on healthy eating outside of the home on 7 questions using a 5-point scale where 5 was indicative of strongly agree. In general parents felt knowledgeable about healthy eating and nutrition for their children ($M=4.4$). In terms of confidence in their ability to teach their children about healthy eating, most participants agreed that they were "confident" in this area ($M=4.2$). When participants were asked if they were concerned about the information children are learning in school

regarding health, there was general concern (M=4.2). Accordingly, participants reported not being certain about teacher’s knowledge on the topic of health and nutrition (M=3), Parents were also not confident that children will learn about healthy eating/nutrition on their own as they grow (M=3.2). Finally, responses to the pre-session survey showed that participants generally believe that the media can play a role in what a child wants to eat and were concerned about their children’s food choices (M=4.6; M=4.8). (See Table 3).

Table 3. Pre-Session Survey Means

Q7 - I feel knowledgeable about healthy eating and nutrition for my children	4.4
Q8 - I feel confident that I can teach my children about healthy eating	4.2
Q9 - I am concerned about the information my children are learning/ will learn in school on health	4.2
Q10 - I believe teachers are generally knowledgeable in terms of health/nutrition	3.0
Q11 - I believe children will learn about healthy eating/nutrition on their own as they grow	3.2
Q12 - I feel the media can play a role in what children want to eat	4.6

Q13 - I am concerned about my child's food choices	4.8
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In addition to the questions described above, the pre session survey asked participants what they hoped to learn from the sessions and what information would be most helpful on this topic. (See Table 4).

Table 4. Pre-Session Short Answer Questions

<i>Question</i>	<i>Responses</i>				
Q14 - What information do you feel would be helpful to have about healthy eating/nutrition?	<i>P1 – I am unsure</i>	<i>P2 – I am unsure</i>	<i>P3 – Portion sizes</i>	<i>P4 – I am unsure</i>	<i>P5 – I am unsure</i>
Q15 - What do you hope to gain from these sessions?	<i>P1 – Everything about healthier eating</i>	<i>P2 – No response</i>	<i>P3 – Tools to help educate my child and guidance</i>	<i>P4 – No response</i>	<i>P5 – Better nutrition for my child</i>

Participants were given the option to enter in a short answer, or if they were not sure or unfamiliar with the topic, they were given the option to respond with “I am unsure.” Overall, participants felt unsure about what would be helpful to them in terms of health and nutrition information, with only one participant responding. The question regarding what parents hoped to gain from the sessions revealed that participants wanted to educate their children and learn about better nutrition and healthier eating.

Post-Session Survey

On the post-session survey, the participants were asked the same 7 Likert scale questions given on the pre-session survey, along with 7 additional questions (4 Likert scale and 3 open ended). The results of this survey showed that, on the Likert scale questions, parents experienced change in their self-reported perceptions. (See Table 5). The post session survey revealed that participants felt slightly more knowledgeable about healthy eating and nutrition for their children and reported a slight increase in confidence to teach their children about nutrition and healthy eating when compared to the pre session survey. Additionally, participant’s feelings about the influence of the media remained unchanged, but that they were more concerned about the ability of schools to promote good health and nutrition and the knowledge of teachers in this subject. Finally, participants were less convinced after the sessions that their children would learn good nutrition habits on their own and more concerned about their children’s nutritional habits. Overall, the sessions appear to have

increased parent self-efficacy while simultaneously alerting parents to the dangers inherent in schools and in not directly addressing children’s health and nutrition habits.

Table 5. Pre- and Post-Session Survey Answer Comparison

<i>Question</i>	<i>Pre-Session Survey Mean</i>	<i>Post-Session Survey Mean</i>	<i>Change from Pre to Post-Session Survey</i>
<i>Q1 – I feel knowledgeable about healthy eating and nutrition for my children</i>	4.4	4.8	+0.4
<i>Q2 – I feel confident that I can teach my children about healthy eating</i>	4.2	4.4	+0.2
<i>Q3 – I am concerned about the information my children are learning/will learn in school</i>	4.2	3.4	-0.8
<i>Q4 – I believe teachers are generally knowledgeable in terms of health/nutrition</i>	3.0	2.2	-0.8

<i>Q5 – I believe children will learn about healthy eating/nutrition on their own as they grow up</i>	3.2	2.0	-1.2
<i>Q6 – I feel the media can play a role in what children want to eat</i>	4.6	4.6	0.0
<i>Q7 – I am concerned about my child's food choices</i>	4.8	4.0	-0.8

In addition to re-visiting the Likert scale questions given on the pre-session survey, the post-session survey contained seven questions that gauged the asked participant's feelings on the utility of the information given in the sessions and whether they felt the sessions were useful. Four of the seven questions gauged the usefulness of the information provided and the likelihood of participants using the information and sharing with others. Table 6 depicts the four self-created survey questions which were evaluated using a 5-point Likert scale. Answers to these Likert scale questions were coded on a 5-point scale where 5=very likely/useful, 4= likely/useful, 3=neutral 2=unlikely/not useful, and 1=very unlikely/not useful.

Table 6. Post-Session Survey Means

<i>Question</i>	<i>Mean</i>
<i>Q1 – How useful do you feel this workshop’s information was?</i>	4.8
<i>Q3 – How likely are you to share the information from this class with others?</i>	3.4
<i>Q6 – How likely are you to share the information provided with your family?</i>	3.6
<i>Q7- How likely are you to use the information provided in this workshop in the future?</i>	3.4

These post-session survey means demonstrate that participants generally found the workshop information to be helpful. With regard to the likelihood of participants using the information presented in the future and sharing this information with their families or others, participants indicated that they were somewhat likely to do these things.

The remaining three questions on the post-session survey asked respondents to provide short answers to better understand what they thought of the sessions and how to better improve the workshop content. (See Table 7).

Table 7. Short Answers from Post-Session Survey

Question	Response				
Q2 – What was the most useful piece of information you learned?	P1 – Learned what a complete protein is	P2 – The importance of vitamins for kids	P3 – That the media plays apart in my child’s food	P4 – Micro nutrition is interesting	P5 – Learning about healthy food choices
Q4 – How can this class be changed to better help those attending?	P1 – Focus on how to get kids to eat healthy foods	P2 – Be more geared to younger kids like babies	P3 – No need to change the class was ran very informative and understandable	P4 – Not much	P5 – No need to change
Q5 – What was the least useful thing you learned from this class?	P1 – Schools impact what kids eat	P2 – Everything was helpful	P3 – Kids are likely to eat the way their parents do	P4 – Importance of vegetables	P5 - Nothing

Questions one, two and three, five focused on the most useful and least useful pieces of information gained from the sessions, according to the participants. The results from the first question demonstrated that participants had different pieces of information that they felt were useful. While four participants chose to list a nutrition and food related piece of information as useful, the remaining participants chose to focus on the topic of media and how it

impacts children as the most useful piece of information. Question three and five revealed that two participants felt there was nothing that was not useful from the workshop. The remaining three participants reported very different pieces of information as least useful, from the impact schools have on nutrition, to the need for children to eat vegetables. Question four on this portion of the post-session survey sought to obtain an understanding of how the class can be altered to serve participants better. The majority of participants felt that there was no need to alter the workshop and the remaining two participants felt information should cater towards parents of younger children or to strategies on how to get children to eat the foods talked about in the sessions.

CHAPTER FOUR

DISCUSSION

Overall, differences on the pre- and post- session survey results scores indicated that participants reported an increase in knowledge and understanding in regards to the importance of child nutrition. It can be concluded from the results that participants felt more knowledgeable about child nutrition and in their ability to teach their children about healthy eating. It is interesting that prior to the sessions, parents did not indicate (on the open-ended survey questions) that they were interested in learning about specific aspects of child nutrition. This could be because parents either thought that they already knew about this topic or that they had not considered additional information that they might be able to gain. There is some evidence that this is true, as parents indicated on the post-session survey that they appreciated learning more about specific nutrition topics such as proteins and vitamins. Perhaps the sessions helped them to realize that there is more to healthy eating than they thought. It also appears that parents increased their self-efficacy, as well as their knowledge (as indicated by their confidence in being able to teach their children about nutrition). This increased self-efficacy may then translate to their children eating more healthy foods. As noted previously in similar research, a high level of parental self-efficacy was positively associated with vegetable and fruit consumption and inversely associated with soft drink consumption (Xu et al., 2013). This area showed the biggest improvement based on responses given. The results from the surveys

also suggest that participants were more confident regarding teaching child nutrition, which was seen in the post workshop survey where they expressed feeling less concerned about their child's food choices and more confident about teaching their children healthy eating habits. The knowledge participants reported gaining in the post survey may have contributed to their shift in confidence on the topic and can be a benefit to parents as Xu, Wen, Rissel, Flood, & Baur (2013) found that when parents who had high self-efficacy about feeding their children healthy meals, and a positive attitude toward their child, were parents of the children who ate larger amount of more healthy foods. Overall, the increases parents experienced in their knowledge and self-efficacy speak to the findings of King & Ling (2015) who found that utilizing educational programs is a vital tool to educate parents on child nutrition education and when parents utilize program information with children, they are more likely to benefit.

The workshop helped to bring awareness to participants as well. When comparing responses from the pre- and post-session survey for the statement "I believe children will learn about healthy eating/nutrition on their own as they grow," participant responses indicated they agreed less with this statement after the workshop. Prior to the start of the sessions, parents reported that they felt that children will learn information on this topic naturally on their own, indicating a shift in mindset on the topic. Although parents exited the parent workshop feeling less sure that children would learn this information on their own, they appear to have realized the impact parents have on children's nutritional knowledge. It is

possible that discussing the importance of modeling healthy eating to young children and engaging children in cooking as a family might have impacted this shift in response. This is important because, as mentioned in the introduction, it is important to instill healthy eating habits in children at an early age, as research shows that as children age, they become less influenced by parental advice on diet and nutrition and lean more toward peer influences (Adamo & Brett, 2014).

After completion of the workshop sessions, parents expressed more concern about their children's food choices and the ability of schools and teachers to support healthy eating habits. This type of knowledge is good for parents to have, as there is ample evidence that schools do not always support healthy eating and children are not always consuming healthy foods. As noted earlier, children often eat unhealthy foods, whether at home or at school (Center for Disease Control and Prevention, 2015; Kharofa, et. al., 2016; Kubik, et. al., 2007; WHO, 2015). This reality speaks to the importance of helping parents understand the importance of monitoring their children's food intake and working closely with school personnel to ensure they are educated in health and nutrition for children.

Prior to the workshop sessions participants felt strongly that the media impacts children's food choices and this awareness did not increase as a result of participation. It is good that participants already knew this information as research clearly indicates that media can influence children's healthy eating habits and this score may indicate that participants have already experienced the

reaction children display when exposed to media marketing food products. As noted earlier, attractive packaging with familiar characters can influence children, who in turn attempt to influence their parents to buy particular items (Taghavi, & Seyedsalehi, 2015). These types of influences make it important that parents are aware of the impact media has on food choices.

The results gathered from the workshop reaffirm in many ways the results seen in other parental interventions discussed earlier. Parents overall showed a greater sense of self efficacy and knowledge about healthy feeding practices for children which was touched on during the workshop session pertaining to practical foods to incorporate into a diet. Participants also displayed an understanding for the importance of teaching children about nutrition which was discussed in the workshop along with the importance of being a model toward children and showed that they were already aware of the impact media can play on what foods children want to eat.

Limitations

The project contained limitations which included the number of participants, the type of participants, the time restrictions on the workshop sessions as well as the sessions being conducted online.

Had more participants been involved in the project, it would have been less of a challenge to gauge the helpfulness of the workshop and how informative it was for those who were involved. With multiple locations and forms of notification about the workshop being held, more participants may have been

aware and able to join, but flyers were posted in only one location, which may have contributed to the low number of participants. Additionally, the workshop was held in the evening and although it was via the participant's personal computer, the participant was still required to take time from their day to log onto the site and attend the meetings. Depending on personal schedules this may have been an inconvenience, leading to lower participation.

Lastly, the workshop was conducted entirely online. Online workshops allow for participants to be involved from home but do not allow for face to face interaction. Although the sessions were completed online and participants were not face to face during the workshop, they were able to communicate via the message board provided to them during the entire length of each session. Had the participants met in person for the sessions, the conversations among participants may have been more fruitful and extensive. Conversations between those in the workshop were minimal, but had they been in person, participants may have found communicating with others easier.

Overall participants reported the information was useful; however, the low number of participants made it difficult to gauge how beneficial the workshop was, in addition to the diversity of participants and the online format of the sessions. These factors may have interfered with the ability of the workshop to provide participants with information on the importance of child nutrition, as well as reaching a broader array of parents.

Future Workshops

While the present workshop was designed to inform participants about nutrition and healthy eating for children, changes can be made that could potentially benefit those being exposed to the information.

The workshop had information on nutrition and eating for children starting at infancy; however, a stronger emphasis on information issues relevant to the first two years of life would be helpful for participants who may be prospective parents or are parents of newborns looking for more information on early infant health. In addition, while the first session did cover brain development in the first five years of life, the topic was not discussed in depth such as developmental milestones.

Covering this topic in greater depth could have potentially reinforced the importance of nutrition early on in a child's life. Another change that can be made is to allow the participants to communicate via the microphone so they can talk to one another. The microphones were disabled during the sessions to ensure that participant environmental noise would not impact the experience for other listening participants; however, this made communication more difficult because participants were required to type out what they wanted to communicate, which can be more time consuming and challenging for some. It may also benefit future workshops to have a larger variety of participants would be recruited to join. Due to the location of the workshop listing, parents, caregivers, and teachers were likely to know it was being held; however, participants could have been recruited online from parenting forums or pregnancy forums and multiple locations instead of a single one to open up the diversity of the sample even

further. Finally, the duration of time that the workshop was run could have been lengthened. There is more information that can be provided to parents on the topic that would be potentially beneficial. When intervention length is compared to the previously mentioned intervention from McGarvey et al., (2004) conducted involving parents who met in group settings for a total of six sessions over the course of a year; the participants reported positive feedback and reported they had implemented change in parenting. Although the results from the study were not dramatic, the length of the study allowed the researchers gauge on the amount of impact the intervention created. Had more time been given along with more information provided, practical application of knowledge would be a possible target to gauge.

Conclusion

This project was created to increase awareness about the importance of healthy nutrition and to educate parents on how foods and nutrition can impact a young child's development. Participants attended a 2-week workshop online consisting of four one-hour long sessions twice each week, which focused on food and nutrition issues related to children's cognitive functioning. The results from surveys administered prior to and after the workshops indicated that parents felt more educated about food and nutrition for their children and reported they found various topics covered to be useful information.

APPENDIX A
PRE-SESSION SURVEY

1. Please indicate your age group:

18-24

25-39

40-59

60 +

2. Please indicate your sex:

Male

Female

Other

3. Please indicate your ethnic background:

Asian

Black

Caucasian

Hispanic

Native American

4. What is your occupation? _____

5. Which of these describe you (check all that apply)

Parent

Teacher

Caregiver

Grandparent

- Other

6. What is the highest level of education you have received?

- high school diploma /GED
- some college
- Bachelors
- Masters or higher

Mark your answer for each question

7. I feel knowledgeable about healthy eating and nutrition for my children.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

8. I feel confident that I can teach my children about diet and healthy eating

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

9. I am concerned about the information my children are learning/ will learn in school on health and nutrition.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

10. I believe teachers are generally knowledgeable in terms of health and nutrition

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

11. Children will learn about healthy eating and nutrition on their own as they grow

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

12. I feel the media plays a role in what my children want to eat

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

13. I am concerned about my child's food choices

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Short answers

14. What information do you feel would be helpful to have about healthy eating and nutrition?

- Answer: _____
- I am unsure

15. What do you hope to learn from these sessions?

- Answer: _____
- I am unsure

Created by Kaitlyn Suha

APPENDIX B
POST-SESSION SURVEY

1. How useful do you feel this workshop's information was for you?
 - Very Useful
 - Somewhat useful
 - Neutral
 - Not very useful
 - Not useful at all

2. What was the most useful piece of information you learned?
 - Very Useful
 - Somewhat useful
 - Neutral
 - Not very useful
 - Not useful at all

3. How likely are you to use the information provided in this workshop in the future
 - Very likely
 - Somewhat likely
 - Neutral
 - Not very likely
 - Not likely at all

4. How can this class be changed to better help those attending?

Answer: _____

4. What was the least useful thing you learned from this class?

Answer: _____

6. How likely are you to share the information from this class with others?

- Very likely
- Somewhat likely
- Neutral
- Not very likely
- Very unlikely

7. How likely are you to use the information provided in your home with your family?

- Very likely
- Somewhat likely
- Neutral
- Not very likely
- Very unlikely

Circle your answer for each question

8. I feel knowledgeable about healthy eating and nutrition for my children.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

9. I feel confident that I can teach my children about diet and healthy eating

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

10. I am concerned about the information my children are learning/ will learn
in school on health and nutrition.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

11. I believe teachers are generally knowledgeable in terms of health and
nutrition

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

12. Children will learn about healthy eating and nutrition on their own as they grow

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

13. I feel the media plays a role in what my children want to eat

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

14. I am concerned about my child's food choices

- Strongly agree
- Agree

- Neutral
- Disagree
- Strongly disagree

Created by Kaitlyn Suha

APPENDIX C
POWERPOINT CURRICULUM

Slide 1



Session 1

An Introduction to Child and Nutrition Knowledge

A Presentation by Kaitlyn Suha

Slide 2

What is Cognitive Development in Early Childhood

- Development occurs rapidly in the first 5 years
- Involves change and growth of mental processes in children
- Build reasoning and logic skills
 - Ability to sort and organize
 - Understand math and numbers
 - Language and word development



Slide 3

What Children Know About Nutrition

- Ensuring children are educated early on can impact how they will eat and the food choices they will make as they grow
- From preschool, children begin to develop a basic understanding of foods
 - Parents, schools, media are influences
 - Beginning to classify by type
 - Are told what is “healthy” or “unhealthy”
 - Understand categories like fruit, meat, bread, candy
- At this age, they cannot fully grasp abstract terms like diet and nutrition

Slide 4

Nutrition and Development

- What children eat heavily impacts their cognitive states
- Starting children off early with an understanding of healthy eating and nutrition knowledge can help ensure optimal growth
- Eating habits from childhood tend to carry on into adulthood
 - Having educated parents is crucial for teaching children early in life

Slide 5

Good Food Choices

- Grains
 - Choose whole grains/wheat or foods without “enriched flour/bleached flour”
- Fruits and vegetables
 - Some fruits may have a higher sugar content than vegetables
- Proteins
 - Proteins can be dairies, meats, or beans like soy combined with grains like rice
- Dairy
 - Look for low fat options and choose organic when possible

Slide 6

Fostering Healthy Eaters

- Parents/guardians play a large role in influencing food choices
 - Important for parents to be informed on nutrition
 - Promote healthy development mentally and physically
 - Guide children to become healthy eaters
 - Avoid common misconceptions and myths:
 - Going vegetarian will help you lose weight and be healthier
 - Dairy products are fattening and unhealthy
 - You should avoid all fats if you’re trying to be healthy
 - Grain products such as bread, pasta, and rice are fattening

Slide 7




Session 2

Developing Good Cognition




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Slide 8



Diet and Nutrition in Child Development

- Diet and nutrition impact mental development
- Food impacts a child's:
 - Alertness
 - Ability to retain info
 - Memory
 - Reaction time
- Important to establish healthy habits for long term eating behaviors, general health and school performance



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Slide 9

Nutritional Impact on the Brain

- High calorie low nutrient-
- Sweets and snacks like cookies, sodas and pop tarts
 - Less alert
 - Slowed response time
 - Inability to focus
 - Brain fog



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Slide 10

Nutritional Impact on the Brain

- Proteins and healthy fats are needed to produce chemicals in the brain that help it to run smoothly
- Foods with amino acids like meats and proteins tend to help with
 - Memory
 - Reaction time
 - Alertness
 - Focus
- Hunger and low blood sugar impact the ability to think clearly
- High Blood sugar can cause problems as well
 - Fatty foods high in empty carbohydrates spike blood sugar
 - Causes fatigue
 - Slows alertness
 - Less likely to retain information
- Not having the right kind of nutrients in the diet can also impact thinking
 - Concentration
 - Reaction time



Slide 11

Vitamins

- Vitamins and minerals are nutrients that are vital in a healthy growing body
- There are 13 vitamins that all contribute to cognitive health
- Vitamin B
 - 70% of Men and 90% of women are low in B vitamins
 - Helps form red blood cells and maintain brain function
 - Plays an important role in the proteins that are part of many chemical reactions in the body
 - B12 can improve cognition and thinking for those who have been lacking in it
 - Folic acid (B9) may lower the risk of the child being born with neural tube defects or delays in language during pregnancy



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Slide 12

Vitamins

- Vitamin D
 - Helps maintain the right blood levels of calcium and phosphorus.
 - Hard to obtain from food alone
 - Deficiency can lead to impaired cognition and thinking
- Vitamin C
 - Capable of reducing oxidants in the brain and protect it as aging happens
 - Prevention of respiratory tract infections in children such as the cold or tonsillitis



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Slide 13

Macronutrients

- Proteins
 - In addition to physical function, protein can help with mental abilities
 - Has been shown to help with memory tasks
 - Amino acids are building blocks for protein
 - Help with mental performance
 - Help to produce important chemicals in the brain needed for healthy function



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Slide 14

Macronutrients

- Fats
 - Also essential, stored in cells for energy in the body
 - Fat produces fatty acids which contribute to
 - Brain development
 - Functioning of the nervous system
 - Cognitive functioning and productions of important hormones



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Slide 15

Macronutrients

- Carbohydrates
 - Simple carbohydrates, usually referred to as sugars, are naturally found in fruit, milk and other unprocessed foods
 - Complex carbohydrates contain more than two sugar molecules
 - Starches and fibers like breads or grains
 - Said to improve thinking in adults and children
 - Memory can be improved
 - Problem solving speed increase
 - Ability to speak clearly increases

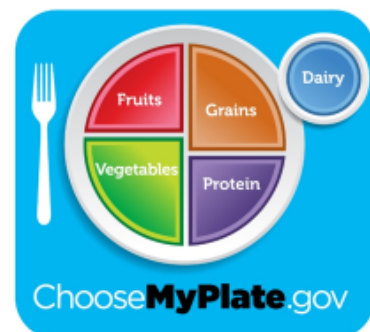


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Slide 16

Foods for Healthy Children

- Fruits, veggies, dairy, grains, and protein are needed to help children grow mentally
 - Grains are an effective source of energy for the brain
 - Fruits and vegetables are high in vitamins and nutrients
 - Dairy is often fortified with nutrients like calcium and vitamin D
 - Proteins have important amino acids and other nutrients for development
 - Fish
 - Red meats
 - Beans and rice



Slide 17



Foods for Healthy Children

- Grains
 - Choose whole grains/wheat or foods without “enriched flour/bleached flour”
 - Wild or brown rice
 - Beans
 - Bread made from grains
 - Potatoes
- Fruits and vegetables
 - Some fruits may have a higher sugar content than vegetables
 - Fruits and veggies with darker/richer colors often have higher vitamin and mineral amounts
 - Romaine lettuce
 - Broccoli
 - Green beans
 - Avocados
 - Tomatoes
 - Berries

Slide 18



Foods for Healthy Children

- Dairy
 - Greek yogurt
 - Kefir
 - Organic milk
 - Low fat cheese
- Proteins
 - Proteins can be dairies, meats, or beans like soy combined with grains like rice
 - Whole soy beans
 - Beans
 - Chicken breast
 - Lean red meats (round steak cut)
 - Eggs

Slide 19

Where to Buy

- Markets tend to have fresher choices as well as more whole food options
- While whole food markets are beneficial in many ways, the average store will have most, if not all of the items from the lists



Slide 20



Session 3

Parent Role in Nutrition

Why Knowing the Facts is Important

- Children are heavily impacted by parent's thoughts and views
 - Parents are the child's first role model and teacher
- Parents who are informed about nutrition and diet are more likely to have healthy foods readily available in the house
- Communicating nutrition information from a young age



Parents Play an Important Role

- When parents allow kids to join in meal preparation:
 - Kids are more likely to eat fruits/veggies
 - Have better understanding about the foods being eaten
 - Gain a sense of responsibility and confidence in their abilities
- Eating with children:
 - Parents demonstrate good eating habits, which teaches children
 - Opens up communication
 - Builds bonds as a family
- A good attitude about nutrition can go a long way
 - Children are more likely to eat what is provided for them when the parent is warm and friendly at meal time

Slide 23

Parent Impact on Eating Habits

- Parents who are informed about proper diet and nutrition will have a better chance of steering kids in the right direction
- Important to shape their eating habits from a young age
 - As children grow, they become less influenced by parental advice on diet and nutrition
 - Peers, schools and media begin to impact



Slide 24

The Power of Modeling

- The food choices parents make, reflect on their kids
 - Children are more likely to have unhealthy diets if their parents make unhealthy choices
 - Children tend to go with what they see often and are familiar with
- Leading by example is important
 - Grocery shopping together
 - Prepping meals together
 - Eating together
- Parents who eat higher amounts of fruits and veggies are said to have children who eat higher amounts of fruits and veggies as well

Parents as Teachers

- Children's' eating behaviors and attitudes are often similar to their parents
 - Healthy and unhealthy diets of parents are reflected in children's eating habits
- Parents who have food education are more likely to:
 - Feed children high nutrient meals
 - Demonstrate proper eating habits
 - Teach children about nutrition
- Most parents are aware of basic knowledge
 - Snack foods are bad
 - Fruits and vegetables are important in a diet



Session 4

Outside Influences on Nutrition

Slide 27

Outside Influences

- Outside influences can impact a child's eating habits
- Parents can work around influences by,
 - Working with teachers and schools to learn more about nutrition programs implemented and what children are being taught
 - Helping children avoid pressure from friends and peers
 - Understanding how media and advertising persuade a child's desire for foods

Slide 28

Learning Nutrition in School

- Parents are the first and main influence, but schools heavily impact children as well
- Teacher's nutrition thoughts and habits play a role in what children learn
 - Teacher's eating habits are modeled onto the children
 - When preschool teachers sit with children during meals, children eat more fruits and vegetables
- Nutrition education programs in schools help to educate children as well as their families
 - Positive results are seen from nutrition programs in schools
 - Parents were more educated on nutrition as well as children
 - Children were more educated and repeated healthier eating habits



Slide 29

Peer Influence

- From a young age, friends and classmates can impact what children choose to eat
 - What are friends eating at school
 - Wanting to share
- Parents must communicate the importance of
 - Making healthy choices rather than choosing what friends have
 - Eating only foods they bring



Slide 30

Parents and Media

- Junk food is more appealing to children with a familiar character on it compared to healthy snacks with a familiar character on it
- Children develop a taste for salty sweet and sour early on and will choose these over healthy foods despite labeling
- Parent influence must come first
 - how?
- T.V. commercials have been shown to directly connect with amount of fatty, calorie dense foods eaten
 - Kids see it on T.V. and want it because of the appealing look
 - Parents can teach children about why these foods are not what they seem



Slide 31

Parents and Media

- Packaging is designed to get attention
 - Attractive packaging influences children
 - When kids are vocal about wanting a product parents are more likely to buy it
- In store advertising can be used to the parent's advantage
 - Can be used as a teaching moment for children
 - Physical appearance can be deceiving
 - Lesson on nutrition
 - Lesson on finances



Slide 32

Tips for Building Healthy Eaters

- Understand nutrition facts and what makes a healthy diet
- Communicate with children the importance of eating healthy
- Prepare meals and eat together when possible
- Keep healthy snack and meal options available in the home

APPENDIX D
INFORMED CONSENT

Informed Consent

The study in which you are being asked to participate is intended to educate parents on the impact of proper nutrition on children's development, as well as to educate parents about the influences on young children's healthy eating. Information sessions will be presented to educate further about this important topic. This study is being conducted by Kaitlyn Suha, Masters in Child Development student, at California State University, San Bernardino. This study has been approved by the Department of Psychology Institutional Review Board subcommittee, of California State University, San Bernardino and a copy of the official Psychology IRB stamp of approval should appear on this consent form. The university requires that you give your consent before participating in this study.

For this study you will be presented with information sessions that are designed to highlight topics of child nutrition and cognitive functioning including; cognitive growth happening in the first 5 years of life, the impact foods make on a diet and which are best for consumption, the importance of parent input and modeling on a child's diet, and other influences on diet and nutrition such as media, peers, and school programs. You will follow a link to an online workshop where sessions will be provided twice a week. Prior to the first session, you will be asked to complete a brief survey regarding their thoughts on diet, your child's diet, and your general health knowledge. After the program has been completed, you will once again be asked to fill out a second survey reflecting on the presented information.

This study does not include any risks to participants beyond what they would encounter in their day-to-day life. The information collected during this study consists of pre and post session surveys to participants. The benefits to participants may include increased knowledge of child nutrition, the ability to choose food for their children that are beneficial, and the ability to help their child choose healthy choices on their own which can provide long term health benefits. The results of this study may also benefit those who are planning to become parents and may benefit those in the teaching field who have the ability to pass the knowledge to children.

Presentation of the results from this study will be presented in group format only. The data will be stored in a password-protected computer within an encrypted file. Following the conclusion of this study you may receive a copy of the results by contacting Kaitlyn Suha at Kaitlyn.suha@csusb.edu.

If you have any questions regarding this study, please contact Kaitlyn Suha (Kaitlyn.suha@csusb.edu) or the Department of Psychology Institutional Review Board subcommittee, of California State University, San Bernardino at psych.irb.csusb.edu

I acknowledge that I have read the above information and freely consent to participate. I acknowledge that I am at least 18 years of age. Please indicate your consent by signing on the line below.

Participant signature _____

Participant name _____

Date: _____

APPENDIX E
POST-STUDY INFORMATION STATEMENT

Post-Study Information Statement

Dear Participant,

Thank you for participating in the Importance of Nutrition for Development in Early Childhood study. I recognize that participation required you to take time out of your already busy day. Your participation has been helpful in learning more about parent knowledge on child nutrition as well as child development. The information for this study may benefit prospective parents in the future. Please contact me if you would like to obtain a copy of the group results of this study. These results include information on the amount knowledge gained from the information sessions presented during the study. You can reach me at kaitlyn.suha@csusb.edu

Sincerely,

Kaitlyn Suha

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