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Introduction

Nutrition has been called “the single greatest environmental influence on babies in the womb, infants, and remains essential throughout the first years of life” (Urban Child Institute, 2011, p.1). The nutrients a child receives while in the womb and throughout the first five years of life can have significant, long lasting impacts on their physical, emotional, and cognitive development (Smith, 2016), and should be closely monitored by caregivers to ensure that nutritional needs are being met. Without proper nutrition during this time, a child’s emotional, and cognitive potential can be limited. As rates of obesity, emotional issues, and executive functioning disorders in children continue to climb, a possible correlation between a child’s diet and the presence of these issues; as well as the quality of their social, emotional, and cognitive functioning has been questioned. Malnutrition can be defined as poor nutrition in terms of receiving too little nutrients to sustain proper functioning of the body (N.; Rohana, A. J.; Manan, W.M. Wan, 2015), or over-nutrition in the form of excessive intake of certain: nutrients, fats, preservatives, and chemicals, and is the reason for nutritional deficiencies that cause physical, mental, and emotional ailments, especially in children. Malnutrition impedes the body’s normal functions, weakens the immune system, making one more vulnerable to disease and the presence of further nutritional deficiencies, and allows for disease to become more severe, and individuals to be less able and likely to recover from them (Rohana et. al, 2015).

Over-nutrition impedes the body’s normal functioning in that too much fat and other nutrients in ones diet forces the body to filter out excess nutrients while fat
inhibits the body from distributing nutrients and oxygen effectively, as well as gives way to an array of physical health and medical issues, as well as emotional issues that come along with being physically limited or challenged. Excessive intake of nutrients can do harm to the body and cause adverse effects of what they are intended to do for the body (Rohana et. al, 2015).

Children who are subjected to poor nutrition in these ways are at greater risk of obesity, mental and emotional problems, and cognitive functioning problems than children whose nutritional needs are properly met. All children are entitled to proper nutrients that allow for normal growth and development and responsible and loving caregivers to make sure their nutritional needs are met.

**Food Insecurity**

Food insecurity, or consumption of lower quality foods that contain less nutritional value, rather than foods with high nutritional value is a leading cause of malnutrition and can occur as a result of inability to afford quality food; forcing one to purchase cheaper, less nutritious foods in place of quality food, lack of availability of nutritional food items, and personal choice to purchase foods of less nutritional value rather than those that contain essential nutrients (Rohana et. al, 2015).

According to the Urban Child Institute, studies comparing children under the age of three years old who were food insecure, to their peers who were not food insecure, have shown that children who are food insecure and whose nutritional needs are not met, are ninety percent more likely to have fair or poor health in comparison to their peers who receive the proper nutrients for their age. Children who are food insecure
also spend thirty percent more time in the hospital, and are seventy-six percent more likely to have cognitive difficulties, especially in language, as well as behavioral problems (Urban Child institute, 2011, p.1).

**Food Insecurity and Obesity**

Food insecurity also fosters obesity in children in that foods consumed in place of quality, nutritional foods, usually contain a higher fat, sodium, and sugar content, as well as chemicals, preservatives, and additives that are not found naturally, and disturb the body’s natural chemical processes and distribution (Urban Child Institute, 2011, p.1). The presence of these chemicals, excess fats, sugars, and sodium causes hormones to fluctuate differently than they would naturally, causing unhealthy and unnatural weight gain and fat content in ones body, as well as effect a child’s ability to control emotions and behavior, concentrate, and learn and retain information. Obesity places children at a significantly greater risk of developing: diabetes, hypertension, high cholesterol, as well as having heart attacks and strokes later in life. Obesity in children also leads to: negative self-image, eating disorders, depression, and anxiety; as well as other mental health issues, and an overall lower quality of life. The psychosocial issues associated with childhood obesity are long-term, and difficult to reverse even through the guidance of mental health professionals (Reeves, 2008).

**Nutrition and Brain Development**

Nutritional deficiencies during fetal growth, infancy, and childhood can impair a child’s brain growth in that it affects cell production, as well as the size and complexity of cells (Prado & Dewey, 2014). At birth, an infant’s head is roughly twenty-five percent
of its overall size, which implies that the brain is the fastest growing part of their body, and likely requires the most nutrients (Urban Child Institute, 2011, p.1). The effects of nutritional and developmental restriction before birth and during infancy cannot be repaired or reversed. Brain growth is also mostly complete by age two, suggesting that proper nutrition before this point is essential for the brain to function normally. Brain development during this time is very easily influenced and affected by the nutrition the child receives (Urban Child Institute, 2011, p.1).

Nutritional deficiencies early in life affect the amount of cells produced in the brain and body, while deficiencies later in childhood affect the size and complexity of cells, dictating how productive and functional they are in the body. The effects of nutritional deficiencies on cells and cognitive development are determined by the extent of the deficiency, length of time one remains nutritionally deficient, and age at which the deficiency is experienced (Prado & Dewey, 2014). Effects of nutritional deficiencies can have severe and permanent effects on a child if the deficiencies are experienced very early in life and for a long period of time. The younger a child is, and the longer they remain deficient in vital nutrients, the more likely they are to experience severe and lasting cognitive, emotional, and physical effects. Nutritional deficiencies in a child while they are still in the womb can essentially render them intellectually disabled; subject them to learning disabilities, and an inability to control their behavior and emotions before they are even born. These issues can be exacerbated if the deficiencies ensue after the child is born (Prado & Dewey, 2014).
According to the SPOON Foundation, long-term effects of deficiencies in vital nutrients on the brain include poor cognitive development, behavioral problems, and inability to understand and regulate emotions. Children who experience severe nutritional deficiencies are subject to learning disabilities, and executive functioning disorders such as Attention Deficit Disorder (ADD), and Attention Deficit Hyperactive Disorder (ADHD) that make it difficult to concentrate on tasks at hand. These children exhibit lower academic performance as their ability to learn and retain information, follow directions, and complete tasks effectively is inhibited. Studies have shown that there is a direct correlation in nutritional deficiencies and presence of: Attention Deficit Disorders (with and without hyper activity), memory deficiency, learning disabilities, impaired academic performance, lower social intelligence, slower and less effective language development, less effective problem solving skills, and decreased IQ scores according to the SPOON Foundation. When the body is deprived of nutrients, it is forced to slow or compromise the growth and functioning of the organs, including the brain, in order to stay alive. The body becomes more focused on survival that growth and development. The body is forced to prioritize what functions are most important.

**Nutrition and Behavior**

A study on children ages six to eight years old, over a two year period, compared the social and emotional behavior of children who were subject to poor nutrition during the first two years of life, to those who were not subject to poor nutrition during the first two years of their lives, found that children who received poor nutrition during the first two years of life were more withdrawn, less helpful, and less physically active than
children who had received proper nutrition during the first two years of life (Karrattii, 2015).

A separate study of children up to two years of age who were born physically smaller than average for their age due to poor nutrition during gestation, and those who received adequate nutrition during gestation; observed that the children who were nutritionally deprived were: less active, less vocally responsive, less cooperative, and had poor attention spans, higher frequencies of anxiety, and exhibited a less happy and positive emotional disposition than children of the same age whose nutritional needs had been met before birth. This study also showed that these same children who had not received adequate nutrition through age two, were more “fidgety” and active when they reached school age (Karrattii, 2015), indicating possible executive functioning disorders, anxiety, and possible continuity of poor nutrition with a diet high in sugar, carbs, fat, and sodium.

Overall, a conclusion can be made from these studies, that children who are nutritionally deprived: have lower levels of self-control, do not exhibit the same temperaments as children who are not nutritionally deprived, and will likely preform at a lower level academically than their peers who receive and have received adequate nutrition, and develop behavioral problems as they get older. It is clear from these studies that children who are nutritionally deprived do not behave in the same way as children who are not nutritionally deprived. Children who do not receive adequate nutrition are overall less attentive to others, less cooperative, and seem less happy and satisfied overall. Children who receive adequate nutrition tend to exhibit overall better
moods, are more able to concentrate and focus on tasks, and control their behaviors and impulses.

**Nutrition and Emotional Behavior**

Minerals such as calcium, and vitamins such as vitamin B, C, and D have proven essential in proper emotional development and regulation in children as well as adults. Nutritional deficiencies and imbalances in children have also proven to be correlated with the development of emotional issues related to: autism, hyperactivity, anxiety and depression, bipolar disorder, and schizophrenia, as well as other psychological disorders and learning disabilities. Nutritional deficiencies in fetal development, infancy, and childhood can render a child unable to learn, adapt normally to social situations, and control and understand their emotions (Proshob & Chandrashekar, 2015).

Children who exhibit these affects as a result of poor nutrition have proven to have difficulty making and maintaining friendships, are unable to develop normal social skills in terms of learning social cues and recognizing emotions and body language in others, and have higher rates of low self-esteem. Children who suffer from emotional issues as a result of malnutrition also often miss more school, preform poorly on academic tasks, and lack the ability to thrive socially. These children also become ill more often also giving way to lost academic time. These children are more likely to be held back grades due to inability to meet developmental milestones.

Overall, a child who suffers from emotional problems, especially in conjunction with an intellectual disability or mental illness due to poor nutrition, are subject to a life with fewer lasting and meaningful relationships that is necessary for personal
satisfaction and growth, feelings of being social outcasts, poor self-image, and inability to thrive academically, and in the workplace in adulthood (Proshob & Chandrashekar, 2015). These children are essentially deemed a life that can feel difficult, meaningless, and empty to them and give way to deep personal dissatisfaction.

**Nutrition and Physical Growth and Health**

Severe deficiencies in nutrition can stunt a child’s bone, muscle, and organ growth causing children who are severely lacking in vital nutrients to be physically smaller and weaker than children who receive adequate nutrition. This is because the body is, again, forced to prioritize its functions (Reeves, 2008). Physical growth becomes less important in comparison to organ function and survival, and will be slowed or compromised if the body receives too little nutrients to facilitate cell production and physical development. When the body is limited in terms of nutrition, it cannot preform all of its duties well and effectively, if at all, and must forgo less important processes and functions if it does not have enough nutrients to carry them out.

Nutritional deprivation also puts children at greater risk of physical illness and further nutritional deficiencies. According to the Spoon Foundation, nutritional deficiencies can lead to a compromised immune system that makes one more susceptible to illnesses, which can become chronic, more severe, and less treatable than in children who are not nutritionally deprived. Children who become physically ill as a result of nutritional deprivation they are less likely to make a full and speedy recovery from their illness than those who receive proper nutrition. Illness in children also leads to further nutritional deprivation and deficiencies as a sick child may refuse food, fluids,
or suffer from diarrhea, which can quickly purge and further deprive the body of vital nutrients. Essentially, children who do not receive adequate nutrition get sick easier than children who do receive adequate nutrition, and their nutritional deficiencies make the body less able to fight the illness on its own, and leave them subject to further nutritional deficiencies when their body does try to rid themselves of the illness through vomiting or diarrhea and aversion to food and beverages (Reeves, 2008).

Role of Vitamins and Minerals

The types of effects nutritional deficiencies can have on children depends on what nutrients are lacking in their diet, and the time frame in which the deficiency or deficiencies occurred. Certain nutrients are more important during certain parts of prenatal development and in the development of the child after birth, and play key roles at different times in the child’s life (Prado & Dewey, 2014, p.273).

A small amount of micronutrients such as: iron, iodine, folic acid, and omega fatty acids, as well as all vitamins can mean the difference between life and death for pregnant women and their unborn child. These nutrients all play a role in development of a fetus, sustaining the mothers’ health, as well as in the child’s development throughout their first five years of life (Prado & Dewey, 2014, p.278).

Vitamin “A” is essential for developing a healthy immune system in infants and children as well as vision health. A deficiency in vitamin A can cause blindness and subject a child to illness as their immune system is compromised (Prado & Dewey, 2014).
Vitamin B is associated with proper cognitive and metabolic functioning as it helps to convert carbohydrates into energy that the body needs to carry out various processes. The effects of deficiencies in vitamin B vary depending on which type of vitamin B one is lacking in. There are several variations of vitamin B that are responsible for different things within the body. Symptoms of deficiencies in the types of vitamin B can range from: weak and brittle hair and nails, slow and poor hair and nail growth, poor quality of skin and skin abnormalities, to weight gain, chronic fatigue, and mental confusion (Prado & Dewey, 2014).

Vitamins C and D work together to ensure proper growth and repair of tissues within the body, as well as proper bone growth and density. These vitamins also promote a healthy immune system and are linked to mood regulation. Deficiencies in these vitamins can give way to: stunted physical growth, depression, fatigue, a compromised immune system, obesity as it relates to hormones released in the brain and produced throughout the body, and problems with mood, emotions, and behavior in children (Prado & Dewey, 2014).

Vitamin E is essential for protecting cells within the body, and preserving overall functioning of the organs. Vitamin E deficiencies in children include: chronic liver disease, neurological deficits, gross lack of coordination of muscle movements with loss of deep tendon reflexes, loss of vibration and position senses, paralysis of extra-ocular muscles responsible for eye movements, and general muscle weakness (Prado & Dewey, 2014).
Sufficient amounts of these vitamins allow a child to grow and function properly as well as their skin and hair to remain healthy and growing as organs remain healthy and well-sustained; while deficiencies in vital nutrients: inhibit growth and development, compromise the immune system as well as skin and muscle tissue, inhibit the brain’s ability to remain alert, learn and retain information, control muscles, regulate mood and emotions and impulses resulting in chronic fatigue, depression and other mental and emotional issues, poor physical functioning, and cognitive development (Prado & Dewey, 2014).

Iodine is essential in the functioning of the thyroid gland, which is responsible for regulating metabolism and growth. Iodine deficiency is the primary cause of learning disabilities and brain damage. Thyroid issues later in life can lead to chronic fatigue, weight gain, hair loss, and mental confusion (Prado & Dewey, 2014).

The body’s iron requirements increase during pregnancy and nursing, as it is responsible for hemoglobin production, which helps cells carry oxygen to organs. Deficiencies in iron during pregnancy can lead to anemia, which can lead to hemorrhages and severe bacterial infections from childbirth, which are responsible for twenty percent of maternal deaths during birth (Prado & Dewey, 2014).

Omega fatty acids are essential in the healthy brain development of children as the majority of the brain is composed of them. Deficiencies in omega fatty acids are related to the presence of mental and behavioral disorders such as: ADHD, depression, impulsive and aggressive behavior, as well as dyspraxia and dementia later in life (Reeves, 2008).
Reversing the Effects of Malnutrition

The extent that the effects of malnutrition in a child can be reversed is determined by the age at which the child suffered the nutritional deficit(s), and for how long. The earlier, and longer the nutritional deficit(s) occur, the more damage that is done, and the harder the effects are to reverse. Reversing the effects of profound nutritional deficiency is not always possible, however, in instances of minor nutritional deficiencies later in childhood, introduction of proper nutrition can be effective in repairing gaps in growth and development. Reversing the affects of malnutrition is much like trying to reverse or treat any other illness or disease. The longer it ensues without intervention, the more intervention is required, and the less likely treatment is to be successful in negating its effects (Prado & Dewey, 2014).

Studies of populations with endemic under nutrition in children in Mexico, Guatemala, and Colombia; revealed that nutritional supplements given to pregnant women, as well as to those same children through age three, proved effective in helping the children to gain height, weight, and improve cognition in comparison to nutritionally deprived children who did not receive supplemental nutrition. Supplemented children had improved literacy, and numeric skills when assessed at various ages throughout young adulthood (Prado & Dewey, 2014).

In another supplementation study, it was found that children's improvements in these areas were greater when the supplementation was given earlier in life. The older the children were when they began receiving supplemented nutrition, the less they benefited from the supplementation (Prado & Dewey, 2014).
Preventing Malnutrition

Malnutrition in children can be prevented early by following nutritional guidelines provided by physicians during pregnancy, as well as routinely taking nutritional supplements as suggested by physicians during pregnancy. Infants also greatly benefit from breastfeeding during infancy as they acquire antibodies from the mother that help them fight infection and disease and provide them with a stronger immune system than non-breastfed children. Breastfeeding also provides children with an opportunity to bond with their parents which is essential in a child’s healthy emotional development. Babies that are not able to establish a trusting relationship with caregivers often develop an array of mental issues such as sociopathic tendencies and overall lack of empathy for others (Smith, 2016, p.2).

Malnutrition can also be prevented by following nutritional guidelines for children as provided by their pediatrician and limiting exposure to foods outside what is recommended for children. Processed foods high in: sugars, fats, preservatives, fillers, additives, and carbohydrates should not be available to children until they are old enough to make educated decisions about their diet. Children who are not exposed to these foods, and only eat natural foods high in nutritional value, will show less interest in processed foods when exposed to them if they become accustomed to nutritious, high quality food. Also, children who are educated early about the value of nutritious foods, the effects of poor diet, are encouraged to make good food choices, and have limited exposure to poor food options will learn to eat well throughout life.
Children do not have the ability to make good food choices in the womb, infancy, and through early childhood and rely on caregivers to provide food that will foster proper growth and development as well as promote a healthy relationship with food. Children learn eating habits from caregivers and others around them, and will model others’ eating habits. It is important for caregivers to set a good example for children as to what they should and should not be eating.

**Relating to Youth Services**

The overall goal of most youth service departments is to ensure that the children’s needs are met, and to eliminate some of their struggles. Youth service departments usually aim to make sure that children are physically, mentally, and emotionally well, which includes making sure that they receive proper nutrition, and providing resources to children and families who do not have the ability to eat properly. Mental and emotional health cannot occur without first being physically well in terms of having ones nutritional needs met. Adults within the community, especially those who work with youth, have a responsibility to children to make sure that they are cared for, and give them the tools to learn to properly care for themselves as they become adults. Children cannot make educated decision about their wellbeing if they are not taught.

**Conclusion**

Proper nutrition in utero, infancy, and childhood is essential for a child’s normal physical, emotional, and cognitive growth. Nutritional deficiencies during this period can have severe and permanent effects on a child. Pregnant mothers who do not meet their own nutritional guidelines while carrying a child put themselves and their child at risk.
for a multitude of physical, mental, and emotional ailments that could render them unable to be successful academically and in employment as adults, unable to have fulfilling relationships, and experience a low sense of self-worth, and a low quality of life. These risks become greater if the nutritional deprivation ensues through childhood. Children who do not receive adequate nutrition are at risk for a variety of learning disabilities, behavioral problems, emotional and mental instability, obesity and all the health risks that are associated with obesity, as well as overall poor physical well being.

A child’s potential is essentially determined by the nutrition they receive from conception on, meaning it can be diminished greatly before a child is even born and able to conceptualize and change what is happening to them as a result of their diet.

Resources are available for caregivers who struggle to provide proper nutrition to children. No child should have to live at a disadvantage as a result of poor diet as it is one hundred percent preventable if caregivers follow nutritional guidelines for themselves if pregnant, and nutritional guidelines as instructed for the child throughout their life; as well as educate them as to what a balanced and nutritious diet is, and the importance of eating well, and model healthy eating habits.
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