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# Nutritional Wellness in Preschoolers with Autism Spectrum Disorder

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## Abstract

Preschool age is a time when children experience erratic appetite and fluctuations in growth and development. Typically developing preschoolers have picky eating habits leading to varied nutrient deficiencies. Dietary inadequacies are further compromised in preschoolers with autism spectrum disorder (ASD) due to abnormal sensory sensitivity, social deficits, and repetitive behaviors of interests. To promote health and wellness in this population, school psychologists and educators in collaboration with registered dietitian nutritionists who are the food and nutrition experts need to identify avenues to promote healthy eating for this pediatric population. This article focuses on nutritional needs and considerations of preschoolers with emphasis on those with ASD, the role of school-based interventions, and practical tips for school psychologists and educators in the promotion of nutritional wellness in preschoolers with ASD.

***Keywords:*** *Preschoolers, Autism Spectrum Disorder, Nutrition, Health Care Professionals*

# Nutritional Wellness in Preschoolers with Autism Spectrum Disorder

Wellness, as defined by the Oxford Dictionary (2018), is the "state of being in good health." According to the World Health Organization (2018), health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." By definition, wellness is holistic. Wellness encompasses not just physical but emotional and mental health as well. When attempting to create positive changes to improve health and wellness, starting in childhood is essential (American Academy of Pediatrics, 2020). School systems often focus on creating wellness initiatives or teams to better promote wellness within their student body (Profili et al., 2017).

School psychologists can take a lead role in creating these initiatives. For school psychologists to be successful in promoting wellness in preschools, they must be able to conceptualize their preschoolers holistically. This means they must consider the mental, emotional, and physical aspects of students' health while also addressing cultural and financial backgrounds that may impact access to health care. Children with special needs, such as those with autism spectrum disorder (ASD), must be given careful consideration. An effective way to promote wellness in a school setting for all children is by working with a factor that impacts various components of health (i.e., the physical, mental, and emotional constituents).

Nutrition is an excellent avenue for this goal, which is why under the Obama Administration many initiatives for creating healthier school lunches and removing unhealthy options from vending machines went into effect (US Department of Agriculture, 2013). There is supporting evidence that nutrition impacts physical health (Szucs & Stoffel, 2016). Current literature is finding stronger ties on the influence of nutrition with mental and emotional health than what was once theorized (Clay, 2017). Due to the impact nutrition has on multiple areas of health, working from a nutrition-based foundation is necessary when promoting wellness in children. This



is especially true for those on the autism spectrum. The intent of this article is to discuss key nutritional considerations for school psychologists and other school professionals (e.g., teachers) working with preschoolers with ASD. The paper will cover the nutritional needs of preschoolers and considerations to support their healthy development. Further, this provides a brief framework of the importance of integrating interprofessional collaborative care into nutrition care for preschoolers.

## Nutritional Needs and Considerations for Typically Developing Preschoolers

Formative years during early childhood is a critical time to establish healthy eating habits (AAP, 2016). For this reason, addressing nutrition in preschoolers is imperative. Adherence of healthy eating habits learned at this time could prevent the onset of chronic diseases (e.g. obesity, heart disease, high blood pressure, and type 2 diabetes). Since nutrition impacts all aspects of health and wellness, food selection and consumption have significant implications on the overall health status of children (AAP, 2016).

Nutrients including macronutrients (i.e. carbohydrate, fat, and protein), micronutrients (i.e. vitamins and minerals), and water are essential. Healthy development of preschoolers is dependent on eating a varied, balanced diet (AAP, 2016). These diets must also be nutrient dense and follow the dietary recommendations appropriate for the child's age. For example, macronutrients such as carbohydrates should provide 45%-65% of the total calorie intake each day (AAP, 2016; Academy of Nutrition and Dietetics, 2014). Carbohydrates should come from foods such as bread, potatoes, pasta, and rice. When balancing the diet of preschoolers, a larger portion of recommended amount of carbohydrates should be met through consumption of complex carbohydrates (i.e., fiber, and starch) while simple carbohydrates (i.e., disaccharides and monosaccharides) should be given in moderation. Examples of complex carbohydrates are whole grain breads, whole wheat products, beans,

and peas. Simple carbohydrates are fruit juices, white bread, and sugary cereals. Lipids (fats) should contribute 25%-35% of the total calories of the preschoolers' diet each day (AAP, 2016; Academy of Nutrition and Dietetics, 2014). Examples of foods with healthy fats for preschoolers to incorporate include consumption of avocados, assortment of nuts, and use of oils such as canola or olive oil.

It is important to remember that limited amounts of foods with trans-fatty acids should be given to preschoolers. Trans-fatty acids are known to elevate total cholesterol and low-density lipoprotein cholesterol (Koletzko, 2015, pp. 51). Too much of trans-fatty acids predisposes preschoolers at risk for developing cardiovascular disease. Examples of foods high in trans-fatty acids are snack foods such as potato chips and/or processed baked goods. Healthy fats that preschoolers should be ingesting come from monounsaturated and polyunsaturated foods such plants oils, flax seeds, sunflower seeds, chia seeds and vegetable oils. Lastly, preschoolers should have 5%-20% of their calorie intake coming from proteins such as nuts, lean meats, fish, cheese, yogurt, legumes, or tofu (AAP, 2016; Academy of Nutrition and Dietetics, 2014).

In addition to meeting recommended levels of macro- and micro-nutrients, calorie requirements must also be attained. For preschool girls and boys, 1,200 calories/day and 1,400 calories/day are recommended, respectively (Academy of Nutrition and Dietetics, 2014). However, for macronutrients, per gram of carbohydrate and protein provides 4 calories while fat provides 9 calories/gram. Selection of nutrient dense, low-calorie foods should be consumed to prevent the onset of obesity and/or other chronic diseases during young age. Obesity may lead to health problems later in life such as heart disease. According to the CDC (2019), around 18.5% of children in the US are overweight, and children with autism are at an even higher risk (Voulgarakis et al., 2017).

Due to the potentially detrimental impact of a poor diet, promoting wellness through nutrition is a preventative care measure. Sometimes when a child's nutrient needs or calorie intake are



unbalanced, it is not as easy to notice signs of nutrient deficiencies. Schools and parents must consider the nutritional value of types of foods served to all preschoolers, not just with preschoolers who are overweight. A child having insufficient amounts of dietary vitamin C may be of a healthy weight, but this is still a nutrient deficiency which needs to be addressed. Additionally, rarely do professionals consider mental health concerns such as depression, Attention Deficit Hyper-Activity Disorder (ADHD), and anxiety as being related to food. However, current research is revealing this as a fallacy (Clay, 2017). Evidence is supporting that nutritional interventions for mental health issues like depression or anxiety, show a beneficial effect (Clay, 2017). One intervention is increasing omega 3 (e.g. mackerel, salmon, flaxseeds, chia seeds, and walnuts) intake for depression and anxiety. When paired with psychological counseling, the positive impact is especially powerful (Clay, 2017). This is because nutrient deficiencies appear to impact dopamine and serotonin production, which is linked to issues in mental and emotional well-being (Clay, 2017). Deficiencies can also have physical consequences which could lead to improper growth or development of infections and diseases.

During the preschool developmental age, children begin to experience changes in their food preferences based on the preferences of those around them (Koletzko et al., 2015 pp. 118). The social influences (e.g. peer pressure, role modeling) preschoolers develop around food choice and eating behaviors may cause families to struggle with ensuring children are eating a balanced diet (Academy of Nutrition and Dietetics, 2014). Often preschoolers will reject fresh fruits and vegetables in preference of sweet or salty snacks like chips. When children eat alternatives to fresh produce, they may meet recommended calorie intake but may lack vital nutrients. Fruits and vegetables are excellent sources of vitamins and minerals that are less prevalent in other foods. Crucial nutrients during preschool years are fiber, calcium, vitamin C, and protein (AAP, 2016; Capone & Sentongo, 2019). Fiber and vitamin C are plant-based nutrients, so avoidance or rejection of these foods can be concerning (Capone

& Sentongo, 2019). Other nutrients of concern are vitamins E, K, folate, and magnesium (Capone & Sentongo, 2019). Frequently eaten foods such as dairy products which are excellent sources of calcium and meats high in protein are generally eaten by preschoolers in larger inappropriate portion sizes. The types of meat (e.g. processed high fat meats versus lean) and additives (e.g. added sugars in milk and yogurt) within these food groups could also lead to nutrient deficiencies.

## Nutritional Needs and Considerations for Preschoolers with Autism Spectrum Disorder

Although nutrient deficiencies may be common in all preschoolers, those with autism are at an even greater risk (Johnson et al., 2014). Autism spectrum disorder (ASD) is a developmental disorder which is characterized by social deficits, abnormal sensory sensitivity, and restricted or repetitive behaviors of interests (APA, 2013). According to the CDC, the prevalence of ASD is 1 in 59, with males have greater incidence than females (CDC, 2018). For this reason, schools have given greater emphasis to learn and understand more about supporting their students with ASD. Symptoms of ASD impact many areas of a preschooler's life including nutrient intake. Preschoolers with ASD require the same nutrient and caloric intake as their typically developing peers, but the presence of their symptoms causes meeting these nutrient requirements to be a challenge. ASD causes sensory sensitivity which has a drastic impact on the types of foods preschoolers are willing to ingest (Johnson et al., 2014). These sensitivities lead to what is known as "food selectivity." Food selectivity is when preschoolers with ASD will only accept foods based on their color, texture, or flavor (McIntosh, Kandiah, & Boucher, 2019). For example, a preschooler with autism may only want to eat foods that are white in color like potatoes, tofu, or bread. While typically developing preschoolers may not want to try foods for social reasons, preschoolers with ASD may be unable to even tolerate these food based on sensory and tactile characteristics. For



autistic preschoolers, the texture, smell, color, or taste of food may be intolerable to their senses (McIntosh, Kandiah, & Boucher, 2019). Therefore, forcing preschoolers with ASD to try a food can lead to an outburst and behavioral problems if handled improperly.

In conjunction with sensory issues, children with ASD also have a higher likelihood of having food-related allergies or intolerances (Brasher, 2016). Allergies and intolerances to food cause children with ASD to be placed on special diets (e.g., elimination diets). Elimination diets exclude troublesome foods such as dairy, casein, gluten, and red food dyes. These foods have been linked to not only issues with digestion, but also externalizing behavior problems such as hyperactivity or tantrums (Brasher, 2016). When following these elimination diets, children will avoid staple food items like bread, pasta, milk, and cereals. Exclusion of these foods may lead to deficiency of nutrients such as vitamins A, D, K, phosphorus, potassium, folate, iron, and manganese (Capone & Sentongo, 2019; Malhi et al., 2017). Although refraining from gluten, casein, and lactose may be beneficial, the deficiencies caused by elimination diets could impair overall growth, development, and health. For example, if children with ASD are lactose intolerant, depending on their severity of their intolerance, they may be unable to drink milk, or eat yogurt and cheese. These three products are excellent sources of calcium and vitamin D. The major mineral calcium and vitamin D are critical to ensure bone development and prevent the occurrence of fractures. Parents and caregivers with children with ASD must be educated in alternative foods rich in these nutrients when following elimination diets (Capone & Sentongo, 2019).

Another nutrition-related risk factor for preschoolers' occurs when they are taking medications for comorbid physical or mental health concerns. While some preschoolers may have these concerns, special consideration must be given to those with ASD. This is because children with ASD are more likely to take medications than their typically developing counterparts (Madden et al., 2017). Many medications deplete the body of nutrients or impact the body's

ability to absorb certain nutrients adequately (Mohn et al., 2018). For example, long term use of cardiovascular medications like warfarin cause an increased need for vitamin D and calcium (Mohn et al., 2018). Without supplementing or increasing foods high in vitamin D, children on this type of medication will see decreases in bone density, poor skin health, and inadequate insulin production (Capone & Sentongo, 2019). If unaddressed, preschoolers may develop early onset of osteoporosis or diabetes. Concurrently, medications may also inhibit the child's ability to consume certain foods. This can also limit the availability of nutrients they absorb. For example, Selective Serotonin Reuptake Inhibitors (SSRI), are antidepressants used to treat depression or anxiety. This serotonin-based medication may be impacted by eating citrus fruits (e.g. grapefruit or Seville oranges). The interaction of SSRIs and citrus fruits can interfere with the metabolism of the medication and affect its efficacy. Citrus fruits are very high in vitamin C, which is vital for vision and connective tissue development of preschoolers (Capone & Sentongo, 2019). Therefore, considerations must be made for preschoolers taking SSRIs to receive recommended levels of vitamin C in a way which does not precipitate further health complications. Medications may also contribute to changes in appetite (Madden et al., 2017), causing increased food refusal. The impact of this refusal may exacerbate concerns for further nutritional deficiencies in children with ASD.

## School-based Intervention

Due to the multifaceted impact of nutrition on overall wellness, addressing nutrition concerns in preschools may be an excellent intervention. Nutrition is an accessible tool to use to promote wellness in young children because preschools provide significant opportunities for an assortment of balanced meals (e.g., breakfast, lunch, and snacks) for many children in the US. Using options like nutrition is paramount because it facilitates early intervention to occur. Appropriate nutrition intervention is imperative for addressing wellness because it will refrain the prevalence and development



of further health disorders. If deficiencies go unaddressed for long duration, reversal of health problems through dietary interventions could become a challenge. The connectedness to the school communities and availability of resources could make implementation of nutrition interventions an easy process in the promotion of better health to preschoolers. For example, a preschool may be able to invite a Registered Dietitian Nutritionist (RDN) to learn about incorporation of creative well-balanced meals and snacks in school menus. An RDN could even host cooking demonstrations catered for parents/caregivers of preschoolers. Another idea is working with the parents of students who have Individualized Education Programs (IEPs) to investigate about a preschoolers eating habits. Through the IEP meetings, school professionals and parents can discuss how the school could best support preschoolers in achieving better nutrition. For children with ASD, another route would be creating Individualized Education Plans (IEPs) which include realistic and attainable nutrition-related goals and objectives. IEPs are best administered when interprofessional collaboration is integrated into the preschool's policies and procedures. To promote wellness, school staff may need to provide parents or collaborate with multiple external referrals like counselors, nurses, or RDNs. An example would be a team effort between school psychologists and teachers knowledgeable on developmental concerns of preschoolers in partnership with RDNs, the food and nutrition experts.

While these suggestions may vary on a school-by-school basis, the following tips provide a guideline for how to integrate collaborative efforts in promoting nutritional wellness in preschools. These tips should be generalized to the local resources available in school communities and be adapted to multicultural needs of the preschoolers and their families. It is also at the discretion of each preschool and their personnel to discuss and disseminate these tips to their groups (e.g. resources, communities, parents/caregivers).

## Tips for School Psychologists and Educators

1. Meet with other faculty and health care professionals (e.g. Registered Dietitian Nutritionist, Nurse, Special Education Teacher, etc.) in the school environment about physical, mental, or emotional concerns of preschoolers.

2. Talk to parents, families and caregivers of preschoolers about observations made and concerns for their eating behaviors and nutritional wellness.

3. Recommend parents of preschoolers to identify their food preferences and to complete a 3-day food diary to be assessed and counseled by an RDN.

4. Identify creative ways to engage the preschooler in eating while at school. Generally, children with ASD are visual learners so share pictures and talk about the foods that they would be offered and served at mealtime.

5. Recommend specific routines, when it comes to mealtimes, snacks, and education as preschoolers with ASD respond to structure well.

6. Use language that is clear, simple, and unambiguous when educating and interacting with preschoolers.

7. Reference MyPlate.gov for nutritional information which meets the needs of preschool-aged children.

8. Become familiar with local RDNs for parental/caregiver referrals.

9. Educate parents on healthy eating and its importance to physical, emotional and mental health.

10. Adopt strategies to reduce preschoolers anxiety especially when it comes to tasting or trying new foods. This maybe a visual or verbal cue that the school psychologist or educator have established in advance to not draw attention to the preschooler with ASD when compared to neurotypical peers.



11. Plan outdoor activities that involve preschoolers with ASD moving and embed this into the nutrition or education lesson plans. Exercise has been shown to alleviate symptoms of autism.

12. Teach social emotional learning skills to preschoolers with ASD using picture books as a class or reading. Educators and psychologists can also demonstrate through role play or by watching videos.

13. Become familiar with local counseling services to refer families for help with stress or behavioral issues related to eating.

14. Be proactive in having multiple school professionals involved in interprofessional education meetings such as IEPs.

15. Collaborate with other preschool professionals in setting individualized realistic goals and objectives for developing and implementing IEP plans for preschoolers with ASD.

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