Investigator/Student: Kristin Crinion, OTS
Committee Member: Michelle Suarez, MS, OTRL, Ph.D
Committee Member: Ben Atchison Ph.D, OTR, FAOTA

Additional Analysis Of Previously Collected Data: Food Choices Of Children With Autism

Information: What we already know

- We know that Autism Spectrum Disorder (ASD) is growing among children. ASD is defined as….

- Dysfunction in social interactions

- Communication

- Have behaviors that can be restricted, repetitive, or stereotyped that can range from mild to severe (American Psychiatric Association, 2012).

- It is currently estimated that approximately 1 in 88 children, 8 years of age, are effected (Center for Disease Control & Prevention, 2012).

Information: What we already know

- It is important to realize that ASD is effecting children and their caregivers in many ways.

- Specifically, children with autism experience food selectivity about 40-60% of the time (Ahearn, Castine, Nault, & Green, 2001; DeMeyer, 1979).

- Food selectivity in children with ASD has the potential to threaten optimal nutrition and decrease quality of life due to dysfunctional mealtime behaviors (Ahearn, Castine, Nault, & Green, 2001; DeMeyer, 1979)

- Food selectivity is frequently defined as having a restricted variety of accepted foods.

- Food refusal as a percentage of foods offered

- Eating a particular food with high frequency (Bandini and colleagues (2010)

Why is this important?

- Why do we need to know the importance of children with ASD and food selectivity?

- Due the to the nature of food selectivity, literature also shows that children with ASD are at a significantly high risk for nutritional deficits.

- Food selectivity correlates with inadequate nutrition (Cornish, 1998; Dovey, Staples, Gibson, & Halford, 2008; Herndon, DiGuiseppi, Johnson, Leiferman & Reynolds, 2009).

- Children with food selectivity can eat as few as 5 different foods (Cermak, Curtin, & Bandini, 2010), increasing the risk for poor nutrition (Cermak, Curtin, & Bandini, 2010).

Why is this important cont.

- Inadaquate nutrition due to food selectivity is also a concern because it impacts quality of life due to dysfunction in social aspects of eating.

- If a family is having a hard time with mealtimes because their child is disruptive and reluctant to try new foods, this can affect the families overall quality of life.

- For example, DeGrace (2004) found that in families with children with ASD, similarly to families with typically developing children, that recalling daily events and planning for the future were common mealtime conversations.

- When there is an additional strain due to the child's feeding challenges, further disruption to the family's ability to engage in mealtime routines can be predicted (Ausderau, & Juarez).

Research Questions

- After discovering that children with ASD are at risk for poor nutrition and poor quality of life surround mealtimes, we came up with three research questions.

- Our first question is, what percentage of a child's total diet is fruit, vegetables, protein, and carbohydrates (the main food groups) for the severe, moderate, and typically selective groups?

- Second, was there a significant difference in the percentage of total diet for each food category depending on the membership in the severe, moderate, or typical selective group?

- Third, out of the two least eaten food groups, fruits and vegetables, are children in the severe selective group eating?

Participants

- We used previously collected data and previous participants.

- The participants include, parents or caregivers of children with autism. The demographic characteristics of these parents and caregivers include: 98% female, 94% obtained some college education, and 96% are Caucasian.

- The data pertaining to the demographic included the gender, education level, race, and ethnicity of the caregiver (Suarez, Nelson, & Curtis, 2013).

- Gender and age of the child was also collected to gain more information about the child (Suarez, Nelson, & Curtis, 2013).

- Lastly, parents were asked to provide information regarding whether their children had been diagnosed with ASD, and, in addition, to provide the source of the diagnosis (e.g. pediatrician, psychologist, or interdisciplinary team) (Suarez, Nelson, & Curtis, 2013).

Methods

↗ The data collected in this study originated from a previous study that included a caregiver survey that allowed for us to have a food acceptance level (severe, moderate, typical), (Suarez et al.,2012). Parents were asked to determine a category representing how many foods their child accepts as part of his or her normal diet (i.e. less than 5, 6-10, 11-20, 21-30, and 31+) (Suarez, Nelson, & Curtis, 2013).

Methods Cont.

- Another survey was used to determine specific food acceptance called the food inventory. This was the primary data used for our study.

- The food inventory asked: "Over the past month and week, which food items has your child eaten? (Suarez et al., 2012) The food inventory included 106 different food items. These food items were listed categorically, starting with dairy products (e.g cheese-mayonnaise/salad, yogurt, ice cream), then vegetables (e.g. green bean, broccoli) and then fruits (e.g. apples, tangerines/clementines) then protein (e.g. chicken, eggs) and ended with carbohydrates (e.g. bread, crackers).

Methods Cont.

→ For all survey and participation information the Human Subjects Institutional Review Board at Western Michigan University approved the study protocol for the initial follow-up survey (Suarez, Nelson, &Curtis, 2013) as well as this extended analysis of the previously collected data.

Results

- Regarding our first research question, what percentage of a child's total diet is fruit, vegetables, protein, and carbohydrates (the main food groups) for the severe, moderate, and typically selective groups?

- We found that in the severe selective group, the food category that children with ASD accept the least is fruits and vegetables. Also, the food category they accept the most is carbohydrates

Results Cont.

- Regarding our second question, was there a significant difference in the percentage of total diet for each food category depending on the membership in the severe, moderate, or typical selective group?

- We found that in the food categories of dairy, fruits, vegetables, and carbohydrates that was a significant difference between the selective groups.

- Specifically, in the food categories of dairy, fruits, and vegetables there was a significant difference between the severe and typical selective groups

- Also, in the food category of carbohydrates that was a significant difference between severe, moderate, and typical selective groups.

- In regards to our last research question, out of the two least eaten food groups, fruits and vegetables, are children in the severe selective group eating?

- After looking at the data collected we found that there were a total of ten vegetables eaten and a total of twelve fruits eaten.

- The vegetables go as follows of most frequently eaten to least frequently eaten: broccoli, potato, carrots, green beans, corn, cucumber, cauliflower, celery, and sweet potato.
  The fruits go as follows from most frequently eaten to least frequently eaten: apple, banana, grapes, apple sauce, strawberries, orange, pears, melon, peaches, raisins, blue berries, and mixed fruit.

Discussion/Why does this matter?

- The results we found from this study show that in the severe selective group, the food categories eaten the least are fruits and vegetables and eaten the most are carbohydrates.

- This could be a possible reason for poor nutrition because children aren't getting the proper nutrients from health foods like fruits and vegetables.

- Another significant result we found is that there is a significant difference in food category acceptance between the severe, moderate, and typical food group.

- Therefore, the severe selective group could be at the greatest risk for developing a nutritional deficit. For example, the severe group greatly differs from the moderate and typical group in the food categories of dairy, fruits, vegetables, and carbohydrates. This could pose a possible risk for the severe group accepting foods in those following categories.

Discussion/Why does this matter cont.

- Finally, we found that out of the least eaten food categories (fruits and vegetables) these foods are accepted, broccoli, potato, carrots, green beans, corn, cucumber, cauliflower, celery, sweet potato, apple, banana, grapes, apple sauce, strawberries, orange, pears, melon, peaches, raisins, blue berries, and mixed fruit.

- Now that we are aware of the specific foods children with ASD are eating in the least eaten food groups, we can inform caregivers and clinicians.

- It is our hope that once they are informed of what the children are more likely to accept, they can introduce those foods first. This could possibly improve nutrition and make meal time more enjoyable and less stressful not only for caregivers and clinicians but for the children as well.

Limitations

- Some limitations to this study include the caregiver reported food inventory, the ASD diagnosis, and the demographic of the population.

- The caregiver reported food inventory is a limitation due to its subjectivity. Also, since it is a caregivers report there could be some inconsistency with the answers.

- The ASD diagnosis is a limitation because it wasn't independently verified and therefore, is also subjective.

- Lastly, the demographic of the population is a limitation because it decreases the generalization due to the demographic being mostly Caucasian female caregivers who completed the food inventory.

Conclusion

- In conclusion, this knowledge and information can help education and inform therapists for future treatment as well as the caregivers and their children.

- It is our hope that our study informs caregivers and clinicians to better improve children with ASD's nutrition and quality of life during meal times.

References

- Ahearn, W. H., Castine, T., Nault, K., & Green, G. (2001). An assessment of food acceptance in children with autism or pervasive developmental disorder-Not otherwise specified. *Journal of Autism and Developmental Disorders, 31,* 505-511

- American Psychiatric Association. (2012). Diagnostic and statistical manual of mental disorders (DSM-5) development. Retrieved from: http://www.dsm5.org

- Ausderau, K., & Juarez, M., (2013). The Impact of Autism Spectrum Disorders and Eating Challenges on Family Mealtimes. *Clinical Research Reports. 5* (5) 315-322).

- Bandini, L. G., Anderson, S. E., Curtin, C., Cermak, S., Evans, E. W., Scampini, R., Maslin, M., & Must, A. (2010). Food selectivity in children with autism spectrum disorders and typically developing children. *The Journal of Pediatrics, 157* (2), 141-144

- Centers for Disease Control and Prevention (CDC). Preva- lence of Autism Spectrum Disorders–Autism and Developmental Disabilities Monitoring Network, United States, 2008. Morbidity and Mortal Weekly Report (MMWR) 2012; Vol. 61(3).

References Cont.

- Bowers, L. (2002). An audit of referrals of children with autistic spectrum disorder to the dietetic service. *Journal of Human Nutrition and Dietetics, 15* (2), 141-144.

- Cermak, S., Curtin, C., & Bandini, L. (2010). Food selectivity and sensory sensitivity in children with autism spectrum disorders. *Journal of the American Dietetic Association, 110* (2), 238-246.

- Cornish, E. (1998). A balanced approach towards healthy eating in autism. *Journal of Human Nutrition and Dietetics, 11*, 501-509.

- DeGrace, B. W. (2004). The everyday occupation of families with children with autism. *American Journal of Occupational Therapy, 58,* 543-550.

- Suarez, M., Nelson, N., Curtis, A., (2012). Associations of physiological factors, age, and sensory over-responsivity with food selectivity in children with autism spectrum disorder. *The Open Journal of Occupational Therapy, 1* (1), 1-4.

- Suarez, M., Nelson, N., Curtis, A., (2013). Longitudinal follow-up of factors associated with food selectivity in children with autism spectrum disorders. Autism, published online.