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Maternal Perceptions of Mealtimes: Comparison of Children with Autism Spectrum Disorder and Children with Typical Development

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Maternal Perceptions of Mealtimes: Comparison of Children with Autism Spectrum Disorder and Children with Typical Development

Abstract

Background: This study examined mealtime techniques reported by mothers of preschool children with Autism Spectrum Disorder (ASD) and mothers of children with typical development (TD). The mothers' perceived levels of success and sources of information for mealtime techniques were also reported.

Method: The participants were 24 mothers of children with ASD (ASD group) and 24 mothers of children with typical development (TD group) between 3 and 6 years of age. The Background Information Survey and the Mealtime Techniques Interview were administered.

Results: The ASD group used significantly more techniques in categories of food appearances, restrictive diets, and vitamin/supplement therapy. The TD group used significantly more techniques in the categories of etiquette and negative consequences. Both groups rated techniques similarly with no significant difference between the perceived rate of success for each category. Finally, 91% of mealtime techniques for both groups were parent generated with few from professionals.

Conclusion: The results showed that many of the mothers in both groups used similar mealtime techniques and most implemented techniques that were self-generated with generally moderate perception of success. Occupational therapists should collaboratively work with families to increase mealtime success by recommending interventions that are individualized and family centered.

Keywords

Autism spectrum disorders, mealtime behaviors, early childhood, parents, questionnaires

Cover Page Footnote

We would like to thank all of the children and their families for participating in this study and Kaylyn Acree, MOT, OTR/L for helping with data collection. In addition, we would like to acknowledge the support of the University of New Mexico Center for Development and Disability in recruiting participants.

Credentials Display and Country

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According to the American Psychiatric Association (APA, 2013), children with a diagnosis of Autism Spectrum Disorder (ASD) exhibit deficits in social communication and social interaction and display repetitive patterns of behavior, interests, or activities. In addition to these core diagnostic features, it has been documented that children with ASD are more likely to exhibit sensory differences, such as overresponding or underresponding to sensory input, that negatively impact their participation in activities of daily living, community participation, and family quality of life (Bagby, Dickie, & Baranek, 2012; O'Donnell, Deitz, Kartin, Nalty, & Dawson, 2012; Tomchek & Dunn, 2007). Moreover, O'Donnell Deitz, Kartin, Nalty, and Dawson (2012) studied a group of 42 children with a diagnosis of ASD or Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS) and found a significant ($p < .001$) relationship between the degree of sensory processing impairments and behavior challenges, including irritability, lethargy, stereotypic behavior, hyperactivity, and inappropriate speech. In addition, Zobel-Lachiusa, Andrianopoulos, Mailloux, and Cermak (2015) found that children with ASD ($n = 34$) showed greater sensory differences and statistically significant differences in mealtime behavior problems than typically developing peers ($n = 34$).

According to the *Occupational Therapy Practice Framework: Domain and Process* (American Occupational Therapy Association [AOTA], 2014), occupational therapy practitioners work with families to participate in co-occupations, such as mealtime. Co-occupation is a term used

to describe engagement in occupation that involves more than one person's involvement (Zemke & Clark, 1996). According to Zemke and Clark (1996), co-occupations are social occupations that are shared between mothers and children.

Occupational therapy intervention “focuses on creating or facilitating opportunities to engage in occupations that lead to participation in desired life situations” (AOTA, 2014, S4). One way practitioners can facilitate engagement in this important co-occupation is by providing family-centered mealtime interventions.

Many parents and caregivers of children with ASD report difficulties with mealtimes and increased negative perceptions of the child's dietary behaviors (Nadon, Feldman, Dunn, & Gisel, 2011; Suarez, Atchison, & Lagerway, 2014). Mealtime difficulties for children with ASD included refusal to eat; food selectivity, such as eating limited types or amounts of foods; and difficult behaviors affecting mealtime (Bandini et al., 2010; Johnson, Handen, Mayer-Costa, & Sacco, 2008; Koegel et al., 2012; Nadon et al., 2011; Postorino et al., 2015; Suarez et al., 2014).

Children with ASD have been reported to have a limited repertoire of food intake due to sensory issues, behavior, or a combination of factors. Research has shown that it is more common for children with ASD to display food selectivity challenges compared to children who are typically developing (Bandini et al., 2010; Johnson et al., 2008; Postorino, et al., 2015; Schreck, Williams, & Smith, 2004; Suarez et al., 2014). Cermak, Curtin, and Bandini (2010) conducted a review of the literature on sensory sensitivity in

children with ASD and how this may impact food selectivity in this population. This literature review included 12 articles with 11 of the studies based on food records, questionnaires, or interviews, and one study included an observation of food intake. They concluded that sensory issues are more common in children with ASD than in typically developing children, and that food selectivity is a major issue for children with ASD, which may occur for various reasons, including sensory sensitivity. The research has also reported that texture, appearance, taste, smell, and temperature influence the food selection of children with ASD (Ahearn, Castine, Nault, & Green, 2001; Johnson et al., 2008; Matson, Fodstad, & Dempsey, 2009). Research also has shown differences between children with ASD who exhibit selective eating and children with ASD without selective eating. Children with ASD and selective eating had significantly lower food intake ($p < .001$) and higher food refusal rates ($p < .001$) compared to children with ASD without selective eating (Tanner et al., 2015). However, Tanner and colleagues (2015) noted that children with ASD and selective eating ($n = 17$) did not differ compared to children with ASD without selective eating ($n = 18$) in the areas of challenging behaviors, sensory reactivity, or repetitive behaviors.

Challenging behaviors during mealtime for children with ASD have been studied. The findings have shown that children with ASD were more likely to exhibit restrictive and inflexible eating behaviors, eat continually throughout the day instead of during specific mealtimes, resist sitting at the table, and throw or dump food during mealtimes

(Koegel et al., 2012; Matson et al., 2009; Volkert & Vaz, 2010). It has been reported that children with ASD exhibited adherence to sameness during mealtimes (Ahearn et al., 2001; Koegel et al., 2012). Suarez et al. (2014) found that all of the mothers of children with ASD ($n = 4$) reported “deep dissatisfaction” with mealtimes and that most of the strategies that they implemented for their children during mealtimes were not working (p. 103). Also, the mothers of children with ASD described mealtimes as “stressful, chaotic, and energy depleting” (Suarez et al., 2014, p. 103).

Parents of typically developing children also report difficulty during the preschool years when it comes to mealtime, such as food refusal or being picky eaters (Berlin et al., 2010; Fulkerson, Story, Neumark-Sztainer, & Rydell, 2008). However, according to Bagby et al. (2012), the parents of children with typical development ($n = 6$) stated that mealtimes were events with more positive meanings compared to the parents of children with ASD ($n = 6$). Fulkerson et al. (2008) reported that families with typically developing children ($n = 107$) identified that the benefits of family mealtimes included conversation, togetherness, eating well, home-cooked food, and experiencing family relations.

Reliable descriptions of the mealtime techniques that parents of children with ASD can implement could provide important information for other families of children with ASD and for professionals. It is important to examine where parents of children with ASD are obtaining information on techniques that they implement (e.g., internet, health care professionals, and/or

other parents) and investigate the efficacy of the techniques. This study was conducted to explore the mealtime techniques used by mothers of preschool children (with and without ASD). The objectives of this study were to

1. Describe and compare the mealtime techniques reported by mothers of preschool children with ASD to techniques reported by mothers of preschool children with typical development (TD).
2. Examine the perceived maternal success of each technique.
3. Describe where mothers of preschool children with ASD and mothers of preschool children with TD get information regarding the mealtime techniques.

Methods

Participants

The participants in this study were mothers of 24 children with a physician's diagnosis of ASD based on the DSM-IV-TR criteria (APA, 1994) between 3 and 6 years of age (ASD group). Children with ASD were recruited through The University of New Mexico Center for Development and Disability (UNM CDD) or were referred to researchers by families already participating in the study. The physician's diagnosis was confirmed through databases at the UNM CDD or through parental report. Children with a developmental disorder other than ASD were excluded from the study.

The control group included mothers of 24 children who were typically developing between 3 and 6 years of age (TD group). Children with delays in the areas of motor development, language

development, or behavior were excluded from the TD group in this study based on parent report. The children in the ASD group and the TD group were matched by age (within 6 months), gender, and ethnicity (parent reported).

Forty-eight children were recruited for this study. Half of the children ($n = 24$) were in the ASD group and half ($n = 24$) were in the TD group. The children were 3 years, 0 months to 5 years, and 10 months of age (ASD group $M = 51.2$ months, $SD = 10.6$; TD group $M = 51.2$ months, $SD = 9.8$). Each group included 12 Caucasian children, 11 Hispanic children and 1 Native American child, and each group included 18 boys and 6 girls.

Even though the level of parental education was not purposefully matched when recruiting participants, the two groups were not statistically different in both mothers' and fathers' levels of education. The variables of mothers working outside of the home and hours worked per week were not purposefully matched and were not statistically different. Income levels for the two groups ranged from $< \$20,000$ to $> \$70,000$ (ASD group: 4 $< \$20,000$, 14 = $\$20,000 - \$70,000$, 5 $> \$70,000$; TD group: 2 $< \$20,000$, 9 = $\$20,000 - \$70,000$, 12 $> \$70,000$).

Instrumentation

The Background Information survey was administered to document the child's age, gender, ethnicity, history of adoption, and birth order. In addition, the Background Information survey collected information on maternal age, education, ethnicity, family income, and maternal employment. This information was used to describe the two

groups and to ensure that demographic characteristics were similar.

The Mealtime Techniques Interview form was used to qualitatively document the mealtime techniques used by the mothers. The interview also focused on the perceived success of each technique and the source from which the technique was developed. An occupational therapist and a physical therapist reviewed the literature to develop the interview questions that focused on mealtime techniques for the Mealtime Techniques Interview. The Mealtime Techniques Interview was piloted with four parents of preschool age children to finalize the questions.

Procedures

The UNM Human Research Review Committee approved this study. Families who qualified were contacted by telephone and interviewed to determine eligibility for the study. A home visit was then scheduled and the first author and two researchers (masters of occupational therapy students) collected data for this study. Before data collection began, the researchers were trained in the data collection techniques. During this home visit, the participants met with data

collectors to complete the Background Information Survey and the Mealtime Techniques Interview. During the Mealtime Techniques Interview, each participant in both groups was asked to report as many mealtime techniques as she could recall. Also, each participant was asked where she obtained the information regarding each of the mealtime techniques. Finally, the participants were asked to rate the level of success for each of the mealtime techniques on a scale of 1 (*not successful*) to 4 (*totally successful*). Each home visit was 60 to 90 min in duration, as other data was collected, and each mother was compensated \$50 for her time.

The Mealtime Techniques Interview was analyzed to determine the techniques the mothers in both groups used during mealtimes. To quantify the data collected in the interview, each response was grouped based on the type of technique reported. The reported data were qualitatively reviewed and grouped into similar items to create 12 Mealtime Techniques Categories (see Table 1). Three members of the research team validated the 12 categories. A Mealtime Techniques Category Dictionary was created to define each category to ensure reliability.

Table 1

Mealtime Techniques Category Dictionary

Restrictive Diets	Gluten-Free, Casein-Free, Sugar-Free, or any other dietary restriction. This category also included the use of multiple types of restrictive diets.
Environmental Manipulation	All attempts by the parent to change the child’s environment with the goal of changing the child’s mealtime behaviors. This included letting the child watch television during the meal, eating at a specific location in the home, or providing special supervision during the meal.
Vitamin/Supplement Therapy	Vitamins and supplements given to change behavior as well as supplemental foods given to the child, such as Ensure.
Positive Reinforcement	Positive techniques, such as a reward given for a desired behavior.
Negative Consequences	A negative reaction, such as a punishment given for an undesired behavior.

Modeling	Another person/family member models the desired behavior for the child.
Food Appearances	Altering the appearance of a food item. This included specific food preparation and packaging requirements.
Allowing the Child to Choose Food Items	Techniques such as only preparing foods the child likes or offering multiple food choices for each meal.
Time	Time limitations for meals or the timing of the meal itself.
Etiquette	The use of etiquette rules, such as the child must eat with utensils or must ask to be excused when finished.
Routine	All attempts to create and follow a routine at mealtime.
Describing Food to Child	Describing the food or the ingredients of the food to the child.

Reliability

Four pilot trials were conducted before collecting the data that were included in the final data analysis. The pilots included two children with ASD and two children with TD. During the pilot sessions, the testing procedures and interview forms were refined, including interview and questionnaire content and order of item administration.

Interrater reliability was established between the first author and the researchers. The researchers followed the same procedures for all data collection. The procedural reliability was assessed at the first data collection session to develop a baseline and was reassessed at every 10th participant. In total, six procedural checks were conducted during the study. Percentages of procedural reliability ranged from 93% to 100% with an average of 96%.

Two researchers used the Mealtime Techniques Category Dictionary to independently categorize the first three and tenth participants' responses. Interrater reliability of coding the mealtime techniques ranged from 83% to 100% with a mean of 94%.

Data Analysis

The Background Information Survey was analyzed using the Fisher's exact test to ensure that the two groups of children were statistically similar. The groups were similar by design, since the convenience sample of children in the ASD group was matched specifically to the children in the TD group.

The Mealtime Techniques Interview was analyzed to determine similarities and differences in the mealtime techniques used by the participants in both groups. Descriptive statistics, such as measures of central tendency, measures of variability, and percentiles, were reported, and the Fischer's exact test was used to analyze the differences. The responses on the Mealtime Techniques Interview were grouped into one of the 12 categories described in Table 1. The participants' responses to where they obtained information regarding each of the mealtime techniques were analyzed and grouped into categories. The participants' reports of perceived level of success for each category of technique were described using means and standard deviations.

Results

Categories of Mealtime Techniques used by the Participants

The mothers in the ASD group used 11 out of the 12 mealtime techniques categories, and the mothers in the TD group used all 12 mealtime techniques categories (see Table 2). The mothers in the ASD group did not use the category describing

food to child. The categories food appearance , vitamin/supplement therapy ($p < .05$), and restrictive diets ($p < .01$) were implemented by the ASD group significantly more than the TD group. Moreover, the TD group implemented the negative consequences ($p < .001$) and etiquette ($p < .01$) categories significantly more than the ASD group.

Table 2

Number of Mealtime Techniques Categories

Mealtime Technique	ASD group n = 24	TD group n = 24	p value
Environmental Manipulation	41	31	NS
Food Appearances	22	4	0.02*
Allowing the Child to Choose	21	22	NS
Restrictive Diets	17	5	0.006**
Time	16	9	NS
Vitamin/Supplement Therapy	13	2	0.02*
Positive Reinforcement	10	13	NS
Modeling	9	12	NS
Etiquette	7	21	0.004**
Routine	4	5	NS
Negative Consequences	2	21	<0.001***
Total Number of Techniques	162	145	

Note. ASD = Autism Spectrum Disorder; TD = Typical Development. * $p < .05$, ** $p < .01$, *** $p < .001$

Due to the semi-structured nature of the Mealtime Techniques Interview that relied solely on maternal report, six of the reported techniques did not fit into any of the 12 categories and were not included in the data. These techniques were (a) keeping a bottle of water by bed to increase water intake, (b) feeding chicken because it seems to make child more alert the next day, (c) smelling family members' food, (d) purchasing fresh vegetables, (e) making mealtime a game, and (f) having the child take a nap during the day.

Success of Mealtime Techniques

The reported level of success for categories of techniques did not differ significantly between the mothers in the ASD group and the mothers in the TD group (see Table 3). Routine and negative consequences had the highest mean (3.00) rating by the mothers in the ASD group, who rated the two categories as moderately successful. None of the categories in the TD group had a mean rating that was 3.00 or above.

Table 3*Reported Level of Success for Mealtime Techniques*

	ASD group n = 24			TD group n = 24			p value
	n	Mean	SD	n	Mean	SD	
Environmental Manipulation	47	2.09	0.66	31	1.81	0.79	NS
Routine	4	3.00	0.00	5	2.20	0.84	NS
Food Appearances	26	2.31	0.62	4	2.75	0.50	NS
Allowing Child to Choose	22	1.95	0.90	22	2.18	1.01	NS
Negative Consequences	2	3.00	0.00	21	1.75	0.85	NS
Restrictive Diets	17	1.88	0.86	6	2.33	0.52	NS
Time	17	2.41	0.51	9	2.00	1.00	NS
Vitamin/Supplement Therapy	13	1.92	0.49	2	2.00	0.00	NS
Positive Reinforcement	13	2.23	1.17	13	2.08	0.86	NS
Modeling	10	2.10	0.57	12	2.08	0.79	NS
Etiquette	10	1.70	0.82	26	1.92	0.63	NS
Describing Food to Child	0	0.00		4	2.00	0.00	n/a

Note. This data was rated on a scale of 0 = not successful, 1 = not successful, 2 = minimally successful, 3 = moderately successful, 4 = totally successful; ASD = Autism Spectrum Disorder, TD = Typical Development, SD = Standard Deviation.

Sources of Mealtime Techniques

Mothers from both groups identified 10 sources of information from which they created and/or implemented mealtime techniques (see Table 4). The majority (91%) of the mealtime techniques

were self-generated by one or both parents. None of the mothers in the TD group cited a physician, occupational therapist, or speech language pathologist as a source; however, one mother cited a nutritionist.

Table 4*Sources of Mealtime Techniques*

Source of Technique	Number of Techniques		Total Percentage
	ASD group n = 24	TD group n = 24	
Self-Generated by Parent	140	145	90.8
Physician	6	0	1.9
Occupational Therapist	6	0	1.9
Speech Language Pathologist	1	0	0.3
Early Intervention Specialist	4	0	1.2
Nutritionist	3	1	1.3
Health Care Assistant	1	0	0.3
Friend or Family Member	0	3	1.0
Internet	2	0	0.6
Book	0	2	0.6

Note. ASD = Autism Spectrum Disorder; TD = Typical Development.

Discussion

Mealtime is an important social co-occupation shared by mothers and children (Zemke & Clark, 1996). The purpose of this study was to investigate mealtime techniques that were being implemented by mothers of preschool children with ASD and mothers of preschool children with TD. In addition, the perceived level of success and source of each mealtime technique were examined.

Categories of Mealtime Techniques Used by the Participants

The mothers in the ASD group used significantly more techniques in the categories of food appearances, restrictive diets, and vitamin/supplement therapy, while the mothers in the TD group used significantly more techniques in the categories of negative consequences and etiquette. Food appearance was more often reported as a mealtime technique for children with ASD in this study. This category included all attempts to alter the appearance of a food item, including specific food preparation and packaging requirements. It has been reported in the research that children with ASD limit their food intake based on texture, package, color, specific means of preparation, appearance, taste, smell, and temperature (Ahearn et al., 2001; Johnson et al., 2008; Matson et al., 2009; Nadon et al., 2010). Also, food selectivity, such as food refusal or limited repertoire of food, has been documented in children with ASD (Zobel-Lachiusa et al., 2015). Several of the mothers of children in the ASD group reported having a routine and a set of rules governing how each meal must be prepared. The

to make it “stripy” or concealing foods that the child does not like inside preferred foods.

Examples of this are melting cheese inside of bread or concealing vegetables in mashed potatoes.

The mothers of the children in the ASD group also used techniques in the restrictive diets category significantly more often than the mothers of the children in the TD group. When discussing restrictive dieting, the mothers in the ASD group that used this technique often reported challenges. For example, it was stated that it was difficult to restrict the diet of one child in a family while still being responsible for an unrestricted meal for the rest of the family. It is noted that researchers have found that the effectiveness of the use of gluten-free, casein-free, or a combination of the two diets for children with ASD are inconclusive (Dosman et al., 2013; Wong & Smith, 2006). A systematic review done by Mulloy and colleagues (2010, 2011) found that the literature available on gluten-free and casein-free diets are not effective in the treatment of core ASD symptoms, such as social and communication deficits and stereotypic/repetitive behaviors. They suggest that these interventions should only be implemented when health care professionals have confirmed that a child has allergies or food intolerances to gluten and/or casein. Techniques that involved limiting certain foods due to allergies were also included in the restrictive dieting category.

This study also showed that the mothers of children in the ASD group used vitamin/supplement therapy significantly more often than the mothers in the TD group. The mothers using a vitamin/supplement technique reported challenges,

such as having to hide supplements in food or having to force their child to take supplements. The research that is available on the effectiveness of vitamin/supplement therapy is limited and has mixed results. Stewart and colleagues (2015) found that children with ASD that were given dietary supplements were more likely to lead to excess micronutrient intake in vitamin A, folic acid, and zinc, while continuing to not meet recommended intake of vitamin D and calcium.

The category of etiquette was significantly different between the two groups, with the mothers of children in the TD group reporting the use of etiquette more at mealtime. During the interview of the mothers of children with ASD, it was often reported that it did not matter how the child ate. If he or she ate something, the mealtime was considered successful. This included allowing the child to come and go from the dinner table or to not use utensils. The category of etiquette brought about many comments from the mothers of children with ASD. One mother of a child with ASD reported that eating out at a restaurant was very difficult due to the child's deviation from the social norms of what is viewed as acceptable at a restaurant. In addition, some families were only able to eat at buffet style restaurants to ensure that there would be at least one food item that the child with ASD would eat.

This study showed that mothers from both groups used environmental manipulation the most to make mealtime more successful. For example, several mothers from both groups reported specific rules regarding whether the television had to be on or off during mealtime. Some mothers reported that

the television must be off because they stated that distractions in the environment posed challenges for the child to focus on mealtime. In contrast, some mothers reported that the television must be on because they believed that the child focused on the television and that this helped keep him or her at the table during mealtime. In addition, many mothers reported that where the child sat during the meal had an impact on the success of mealtime. Some families in both groups required that the child sit at the dinner table with the family, while other families set up a separate table for the child in another room of the house.

Success of Mealtime Techniques

The maternal perceived rating of success for all 12 categories was not significantly different between the two groups. This suggests that one technique might not be more successful across families with or without children with ASD. The data showed that the mothers in both groups found most of the techniques to be minimally successful. The mothers in the ASD group reported seven of the 12 categories with a mean level of success above a 2.00 (*minimally successful*) and two of those categories—routine and negative consequences—with a mean level of success of a 3.00 (*moderately successful*). It is important to note, though, that these two categories had the least number of techniques (4 and 2, respectively). However, when mothers used these techniques, they perceived them to be the most successful during mealtimes.

The mothers in the TD group found nine of the 12 categories to be minimally successful. The category that had the highest reported level of

success was food appearance, with a mean score of 2.75, and the lowest reported level of success was negative consequences, with a mean score of 1.75. This suggests that the mothers in the TD group found a minimal level of success when it came to mealtime techniques they implemented for their preschoolers.

Mothers in both groups relied on different techniques to best support their child during mealtimes. This study illustrates the importance of providing interventions for the entire family as opposed to just the child. An intervention may not be perceived as successful if the intervention was successful for the child but not for the entire family. This research aligns with the findings by Suarez and colleagues (2014), who found that mothers of children with ASD reported that the strategies they implemented at mealtime were not consistently successful and felt frustrated with their mealtime experience.

Sources of Mealtime Techniques

Overall, the majority of the mothers of children in the ASD group reported self-generated techniques, with only 21 of the 163 techniques reported as suggested by health care professionals, including six physicians, six occupational therapists, four early intervention specialists, three nutritionists, one speech language pathologist, and one health care assistant. Therefore, this data suggests that most mothers are relying on self-generated techniques to increase the success of mealtimes and that few mothers of children with ASD are receiving and/or using mealtime suggestions offered by professionals. However, the

empowering for the mothers to try their own techniques rather than depend on the suggestions of professionals.

Out of the nine mothers who reported using techniques from the vitamin/supplement therapy category, three mothers reported obtaining the technique from a physician, one from the internet, and five mothers reported the technique as parent generated. Moreover, data from this study showed that the mothers that used techniques from the restrictive diets and vitamin/supplement therapy categories were more often self-generated. Again, these findings suggest that most of the mothers of children in the ASD group did not base their interventions on the suggestions of professionals.

Implications for Practice

Occupational therapists and other professionals working with families who have a child with ASD need to collaborate with the families to develop mealtime techniques that are individualized and family centered in order to increase participation in this important co-occupation. Whether the families in this study did not get suggestions from professionals, or the families did not get suggestions in a way that was helpful, this data suggests that mothers perceived mealtime challenges as an area in which self-generated techniques were the best option.

Several ways occupational therapists can implement a collaborative approach to increase participation in mealtime are to observe mealtimes in natural settings during regular mealtime hours of the family, interview the parents to understand the family's history of mealtime techniques and their level of success for the family, and provide

coaching techniques that incorporates the parents' goals of what they want to accomplish during mealtimes.

This study brings forward the need for increased collaboration on interdisciplinary teams supporting children with ASD and their families. Due to potentially conflicting information available to families, it is important that interdisciplinary teams work together to ensure that families are not given conflicting intervention plans for mealtime.

Implications for Future Research

This study highlights the need for families of children with ASD to receive mealtime recommendations that are part of a collaborative approach between the occupational therapist and the family to increase participation in mealtime. The current research on children with ASD and mealtimes mostly focuses on food selectivity. More research is needed not only to address the food intake of a child with ASD, but also to investigate mealtime as an important co-occupation shared by families. Research should identify the different areas of importance to families regarding mealtimes, including food intake and nutrition, family togetherness, mealtime behavior and etiquette, and/or participation in community settings for mealtimes. Identifying what individualized families define as important may increase the availability of mealtime interventions that occupational therapists can recommend.

Limitations

Several limitations exist with this study, including the small number of participants and that this study relied solely on the report of mothers of the children. The mothers may or may not have

reported all mealtime techniques used during family mealtimes or may have reported only the most recently used techniques. This study also asked mothers to rate perceived success on a 4-point scale. Using a larger scale of perceived success may have allowed a clearer and representative illustration of the success of each category of technique.

Conclusions

This study showed that the mothers in the ASD group used 11 out of the 12 mealtime techniques categories and the mothers in the TD group used techniques from all 12 of the mealtime categories. The mothers in the ASD group used significantly more techniques in the categories of food appearances, restrictive diets, and vitamin/supplement therapy, while the mothers in the TD group used significantly more techniques in the categories of negative consequences and etiquette. Mothers from both groups used environmental manipulation the most to make mealtime more successful.

The reported level of success on a scale of 1 (*not successful*) to 4 (*totally successful*) for mealtime techniques categories did not differ significantly between the groups. In addition, the mothers in the ASD group reported two categories as moderately successful—routine and negative consequences—while the mothers in the TD group found that none of the techniques they used were moderately or totally successful.

Lastly, the mothers of children with ASD are mostly implementing techniques for mealtimes that are self-generated versus recommended by health care professionals. The majority (91%) of

the mealtime techniques were self-generated by one or both parents.

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