OCCUPATIONAL THERAPY HOME FEEDING HANDOUTS FOR FAMILIES TO IMPROVE MEALTIME EXPERIENCES IN YOUNG CHILDREN

A Thesis submitted to the faculty at Stanbridge University in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy

by

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Certification of Approval

I certify that I have read *Occupational Therapy Home Feeding Handouts for Families to Improve Mealtime Experiences in Young Children* by Paige Boggess, Marli Boswell, Beah Grace Flores, and Mandeep Kaur, and in my opinion, this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy at Stanbridge University.

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Dedication

This thesis project is dedicated to our families, friends, and professors at Stanbridge University.

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We would like to thank our thesis advisor, Dr. Naomi Achondo for her unwavering support, encouragement, and guidance throughout this thesis project. We also would like to express gratitude for the continual support of our families and friends throughout all our efforts.

Abstract

We created handouts for our partnered therapy center as our thesis project. The purpose of this project is to create home feeding handouts with occupational therapy (OT) feeding interventions for families addressing feeding issues with their children. These OT feeding handouts are inclusive of different races, ethnicities, gender, and socioeconomic statuses, through the use of representative pictures and strategies that account for differing lived experiences. These are aimed to be educational to families in order to promote occupational justice and create positive mealtime experiences. The inclusion of evidence-based strategies to address aversive feeding behaviors and increase the dissemination of knowledge regarding picky eating behaviors are included in the handouts to bridge the gaps between families, interventions, and specialists. The evidence-based OT feeding handouts were designed to present a comprehensive overview of different feeding difficulties including oral motor, sensory processing, autism spectrum disorder, and picky eating.

Our project aimed to answer the question: Will occupational therapy students have the ability to create evidence-based feeding handouts that can bridge the gap between in-clinic therapy sessions and caregiver-led mealtime experiences in the home? Our population of focus is families with children, toddlers to elementary school age, that display challenges with feeding. Our intervention focused on the implementation of evidence-based OT home feeding handouts. The outcome of this project was to create educational handouts that can be used to increase positive mealtime experiences for families through developing children's feeding skills. We hypothesized that the evidence-

based OT home feeding handouts will help create positive family mealtime experiences which will decrease the risk of feeding difficulties in young children at NJA Therapy.

Table of Contents

Occupational Therapy Home Feeding Handouts

Feeding is an integral part of our survival as human beings. The Occupational Therapy Practice Framework includes feeding as an essential activity of daily living, and it is crucial for survival and daily participation in occupations (American Occupational Therapy Association [AOTA], 2020b). Aside from being the mechanism in which we intake all our nutrients and sources of energy, feeding has a unique way of teaching us how to communicate and socialize with others. However, many children experience challenges with feeding, which can present as early as birth. The World Health Organization International Classification of Functioning, Disability, and Health defines pediatric feeding disorder as "impaired oral intake that is not age-appropriate and is associated with medical, nutritional, feeding skill, and/or psychosocial dysfunction" (Goday et al., 2019). Disorders of feeding are most commonly present in individuals diagnosed with autism spectrum disorder (ASD), a developmental disability/delay, or those with dysfunctions of the gastrointestinal tract, cardiorespiratory, or neurological systems.

Statement of Problem

According to Benjasuwantep et al. (2013), feeding difficulties have been reported in 20-50% of typically developing children and 70-89% of children diagnosed with developmental disabilities. Children that are born prematurely or at a low birth weight are at a higher risk of being diagnosed with ASD. In fact, seven percent of premature babies were found to be diagnosed with ASD compared to the 0.76% prevalence rate of ASD in the general population (Agrawal et al., 2018). Many children diagnosed with ASD also experience sensory processing challenges which can create difficulties in their ability to

adjust to the many different tastes, smells, and textures food has to offer. This explains why researchers have found that 46-89% of children with ASD also have a feeding disorder (Ledford & Gast, 2006).

Aside from the sensory sensitivities associated with premature births and a diagnosis of ASD, Goday et al. (2019) have also found that dysfunction in systems throughout the body can influence the development of feeding disorders in children. Feeding is critical to our survival; therefore, understanding how interruptions to the feeding process arise is especially important to the therapeutic intervention process.

Purpose

The purpose of this project is to create evidence-based educational feeding handouts to assist parents/caregivers in addressing feeding difficulties in the home environment. These handouts will disseminate knowledge regarding typical feeding milestones, warning signs of feeding difficulties, and evidence-based strategies to address multiple factors influencing the mealtime experience in the home environment. Research on evidence-based strategies to address aversive feeding behaviors will be included to bridge the gaps between families, interventions, and specialists and increase the dissemination of knowledge regarding picky eating behaviors. Though we will be considering all families' needs, no study participants will be recruited for this project.

The question this project aims to answer is as follows: will occupational therapy students have the ability to create evidence-based feeding handouts that can bridge the gap between in-clinic therapy sessions and caregiver-led mealtime experiences in the home? The population focus is families with children, toddlers to elementary school age, that display challenges with feeding. Because most of the literature on feeding difficulties

focuses on children within this age range, we chose to create evidence-based educational handouts for this population. Our proposed intervention included evidence-based occupational therapy (OT) home feeding handouts. The outcome of this project was to create educational handouts that can be used to increase positive mealtime experiences for families through developing children's feeding skills. We hypothesize that the creation of evidence-based OT feeding handouts will help create positive family mealtime experiences which may decrease the risk of feeding difficulties in young children. We will disseminate these OT feeding handouts at the Southern California-based NJA Therapy Services. NJA Therapy provides OT services to the pediatric population, including feeding interventions.

Literature Review

Typical Feeding Milestones

Eating habits starting from birth significantly impact immediate and future health. A typically developing child is recommended breast milk as the ideal food to cover all nutritional needs from birth up until 4-6 months (Hernell & Schmitz, 2005). Newborns have a suck and swallow breathing pattern that allows them to easily breastfeed (Butte et al., 2004). When the infant reaches the head-up stage, they are then able to bottle feed where they now have a choice to switch to infant formula. The Center for Disease Control and Prevention ([CDC], 2021) states that children can begin eating solid foods other than breast milk or formula at the age of 6-months. At 6-months of age, a child can sit in the supported upright position, can now recognize spoons, and are responsive to their hunger. At this stage, parents can incorporate thin pureed foods and infant cereals. When the child can independently sit, they can move on to thicker pureed foods, soft

mashed foods, and 100% fruit juice (Butte et al., 2004). At around 9 months of age, the American Academy of Pediatrics (American Academy of Pediatrics, 2021) recommends maintaining fruit and vegetable consumption in infants once finger foods have been introduced. At the crawling age, between 6 and 9 months, the infant can move onto foods with soft texture and crunchy foods that dissolve such as infant crackers. When the child begins to walk, between 9 and 12 months, bite-sized pieces of food and toddler foods are incorporated. By 2 years old, the toddler can eat coarsely chopped foods and they are efficient at eating foods of varying textures and taking controlled bites of soft solids, hard solids, or crunchy foods. Some skills children learn by age two are finger feeding, drinking from a cup, and using a spoon (CDC, 2021).

Family Roles in Mealtime

Childhood eating behaviors are critical as they may translate into their adult eating behaviors. Although some behaviors may occur naturally such as genetics and taste preferences, some nurturing aspects come from parenting style, food availability, and exposure (Patel et al., 2020). Eating as a family is a social context, in which children can observe parents and pick up potential behaviors. A study conducted by Hammons et al. (2021) studied Hispanic mother's perspectives on their ability to implement healthy changes within their families as they are typically responsible for grocery shopping and meal preparation. The study implied that family interventions such as empowering mothers and providing healthy meal strategies may result in meaningful family mealtimes. Although this perspective is from a subgroup of Hispanic mothers, providing similar interventions to mothers who have similar struggles with implementing healthy strategies may lead to positive mealtime experiences with their children. Family meals

were found to contribute the most to modeling children's dietary habits as it is an important moment of control and interaction between parents and their children.

Therefore, it is suggested that positive encouragement and decreased pressure could have a positive impact on children's dietary behaviors (Mahmood et al., 2021). A more positive climate during family mealtimes was associated with lower chances of picky eating behavior (Cole et al., 2018). A study conducted by Jansen et al. (2014) used The Feeding Practices and Structure Questionnaire and found that structured family mealtimes were associated with more food enjoyment and less fussy eating. In addition, the usefulness of meal preparation has been shown in other research that may positively help picky eating, however, more research is needed on this topic (Broad, 2020). A study by Trofholz et al. (2017) indicated that parents tend to exhibit high amounts of stress when deciding what to cook for their picky children. Some parents tend to make their children a separate meal while others use a "take it or leave it" style of approach. Regardless, the common theme that emerges here is that children described as picky eaters cause meal-related stress in the family dynamic.

Occupational Therapy and Feeding in Children

OT practitioners enable people to live life to the fullest by promoting health and wellness or living better with their injury, disability, or illness (AOTA, n.d.). Occupational therapists have the education, knowledge, and skills to help clients who have feeding, eating, and swallowing issues. By utilizing a holistic perspective, occupational therapists create interventions based on physiological, psychosocial, cultural, and environmental factors. Occupational therapists are trained to conduct comprehensive evaluations and develop specific intervention plans and provide

therapeutic integration for feeding, eating, and swallowing in context to the client's daily routines. They also work in many settings varying from neonatal intensive care units to skilled nursing facilities to address feeding across a person's lifespan. OT practitioners work with family members to ensure a client-centered intervention process (Boop & Smith, 2017).

Occupational Therapy Interventions

In order to improve the process of feeding in children with food aversions, occupational therapists implement a variety of interventions to increase the chances of feeding successfully. There is a multitude of reasons a child may have difficulty with feeding; therefore, interventions vary across the board. Interventions can be broken down into more specific categories such as behavioral, family-centered, and sensory interventions.

Behavioral Interventions

Behavioral interventions that are used include, but are not limited to, positive reinforcement, the removal of a reinforcer, shaping, manual guidance, and discrimination (Kerwin, 1999). Parent-directed and educational interventions are proven effective in promoting children's physical growth and development, allowing for stronger parent-child interaction, and increasing the proficiency of feeding in both the child and their caretakers. According to Harris et al. (2021), parent reported child autistic traits and constipation have a positive association in food selectivity. This results in children being more aversive in their diets. Physiological interventions focus on the mechanics involved in the process of eating. These interventions target the physical and sensory functions that

support breathing, sucking, and swallowing in order to improve the biological development of children (Howe & Wang, 2013).

Family-Centered Interventions

Family-centered interventions are utilized when working with children that are picky eaters. In a child's natural environment there are parents, caregivers, or siblings. Each person in the home can be included in interventions by being educated and coached by a therapist. The parent or caregiver's role is to provide a mealtime structure of when and where the child will eat their meal. The family could also provide a positive environment for the child and present a variety of foods the child can choose from (Tseng & Biagioli, 2009). Eating the same food and together as a family can help the child feel confident to try new foods as well.

Sensory Interventions

Picky eating has been linked to sensory reactivity difficulties. In the general population, about 5-10% of children experience sensory difficulties (Gándara-Gafo et al., 2021). Food sensitivity can be due to food textures such as mushy, tough, crunchy, or chewy. Hidden ingredients such as chopped vegetables or nuts/seeds added to meals can change the texture of food items and impact a child's sensitivity to textured foods. Examples of taste and tactile sensory sensitivity come from fibrous and moist food. Auditory sensitivity can be from biting into crunchy food. This can become a problem as food selectivity directly affects nutritional intake (Reche-Olmedo et al., 2021).

Gándara-Gafo et al. (2021) conducted a case study on a typically developing child experiencing food refusal, utilizing Ayres' sensory integration approach. The intervention included reframing the behavior and exposing the child to sensorimotor activities for

more typical sensory responses to improve occupational performance in feeding. After three months of the intervention the family reported that she ate all the food presented and there were no more problems during her mealtimes.

In addition, a randomized controlled trial on toddlers with food refusal was assigned to an intervention or controlled group. Toddlers were evaluated at the beginning and the end of the intervention based on the Behavioral Pediatrics Feeding Assessment Scale and sensory processing ability using the Infant/ Toddler sensory profile. The intervention group received a sensory-based feeding intervention delivered by an occupational therapist trained in Sequential Oral Sensory (SOS) approach. Both groups received nutritional education. Results showed that there was a significance in Behavioral Pediatrics Feeding Assessment Scale in the intervention group while the control group did not show any significant changes. This concluded that sensory intervention was effective in improving mealtime behavior in toddlers with food refusal (Kim et al., 2021).

Hawkins et al. (2020), were also interested in testing the impact tactile play had on oral acceptance of wet food items. Researchers conducted a mixed-methods, quasi-experimental study in which 3 participants completed the 23-step modified SOS hierarchy (Hawkins et al., 2020). This six-week study involved three 15-minute research sessions in which each child played with a wet, non-food item and was rewarded with play time. Caregivers also tracked each child's progress throughout the week and reported their observations. Researchers concluded that incorporating tactile play with a wet, non-food item of similar texture to a non-preferred food item positively impacted the child's oral acceptance to the non-preferred, wet food item after play (Hawkins et al.,

2020). This study further highlights the importance of play-based interventions when working with children diagnosed with sensory processing issues.

Theoretical Framework

Person-Environment-Occupation-Performance Theory

The Person-Environment-Occupation-Performance Model (PEOP) was first published in 1991 by Charles Christiansen and Carolyn Baum (Bass et al., 2017). This top-down approach is used to describe the complexity of the person, environment and occupations relationship. It describes how a person's capabilities, and the support of the environment is connected to occupational performance. Occupations are the wants and needs of people in their daily lives that can be experienced through activities, tasks and roles. Occupational performance is how effectively a person is able to engage in their occupations. Personal factors are the specifics about the person cognitively, psychologically, physiologically, behaviorally and spiritually. Lastly, environmental factors are extrinsic factors such as social determinants, culture, education, physical environment, etc. that may support or limit a person's ability to engage in occupations or their occupational performance.

Occupational therapists utilize this model and analyze 1) client information, 2) evaluation and assessment of personal factors and environmental factors that limit or support occupational performance, 3) implement interventions and 4) evaluate outcome measures. Occupational therapists work with individuals to promote occupational performance which enables participation in everyday life that contributes to overall well-being (Bass et al., 2017).

The core theoretical assumption of the PEOP model is that every person has an innate desire to master his or her environment. The desire to master something is a psychological factor such as motivation, self- concept, self- esteem, and self- efficacy. The environment consists of extrinsic factors that can help an individual with their desire of mastery. An occupational therapist uses this client- centered approach by gathering a client's view of a problem, assessing occupational performance, participation and overall well- being (Cole & Tufano, 2020).

By utilizing the PEOP model, occupational therapists can play an important role in changing family- mealtime experiences for children that have picky eating behaviors. Most assessments are usually through parent reports and recalling information about their child. The most reported intrinsic features of a child who has picky eating behaviors are an increase in sensitivity to smell and taste and the child's personality. The most extrinsic features reported are authoritarian parenting, rewards for eating, and pressuring the child to eat (Chilman et al., 2021). By using the PEOP model, occupational therapists can help parents and caregivers navigate through picky eating concerns, educate, modify or promote positive meal-time behaviors that lead to positive outcomes in performance, participation and well-being that can be translated into the home environment. By creating a compilation of OT interventions to help with picky eating, the home environment will be part of the child's routine in hopes of enhancing their intrinsic factors.

Sensory Integration Theory

Sensory Integration is a theoretical framework developed by Jean Ayres in the 1970's (Ayres & Robbins, 1979). This theory focuses on how people register and

discriminate all their senses in order to produce functional and adaptive behavioral responses to the environment around them (Bodison et al., 2008). As humans, we have seven senses: touch (tactile), smell (olfactory), taste (gustatory), sight (visual), hearing (auditory), movement (proprioceptive), and balance (vestibular). When these sensory systems are not processing sensory information correctly, difficulties adapting to the environment may arise and impact our behavioral response to new challenges as a result.

The mealtime experience requires the use of all our senses; therefore, children with sensory processing issues often result in challenges during feeding. Infants and children that are hypersensitive to various textures experience too much tactile stimulation which can draw their attention to these stimuli, resulting in their inability to properly suck, chew, or swallow when eating (Davis et al., 2014). On the contrary, those with hyposensitivity might be unaware of the food in their mouth which can also impact the suck-swallow rhythm. Just as the ability to perceive various food textures influences the feeding experience, the inability to process other sensory information complicates mealtimes and can present many challenges for a developing child when feeding. When the sensory systems are not working effectively, the body is unable to form an adaptive response that elicits functional behavior. The physiological response that occurs when our sensory systems are not working properly can be traumatic for the developing infant and cause behavioral responses in the form of fussiness and resistance to food groups/textures, or refusal to eat entirely.

Through the guidance of skilled OTs using Ayres Sensory Integration, parents can learn how to tap into their child's unique sensory preferences in order to increase their acceptance to different food textures, smells, and tastes and improve mealtime

experiences. The “just-right” challenge can be utilized to incorporate new foods that are just above where the child is comfortable in order to promote progressive acceptance when introducing new food items. MealSense is a sensory integration-based feeding education program for parents of children diagnosed with ASD. In developing this education program, researchers found that incorporating the child’s interests and facilitating exploratory play during mealtime experiences encourages acceptance of new foods and promotes positive feeding experiences for the child (Trewin et al., 2022). Furthermore, educating families on the principles of sensory integration and how their child’s picky eating manifests is critical for parent-child collaboration as it provides explanations for fussiness and restrictive eating behaviors. Ayres's Sensory Integration approach forms the foundation of our research project as the sensory systems impact every aspect of the feeding experience. Educating families about sensory processing issues is critical for increasing positive mealtime experiences in the child’s natural environment.

Behavioral Theory

Behaviorism is a theoretical framework that explains learned human behavior through external physical stimuli, responses, learning histories, and reinforcements (Zalta, 2019). Psychological Behaviorism was coined by Ivan Pavlov and was later influenced by the work of Edward Thorndike, John B. Watson, and B. F. Skinner. An example of the practical use of behaviorism is the drooling dog. According to behaviorism, a dog can be conditioned to drool at the sound of a bell if the sound was repeatedly presented with food. This translates into practice as seen in Applied

Behavioral Analysis and is used in many other medical fields including OT (Tarbox et al., 2020).

Many studies have shown the success of behaviorism and a behavioral approach when trying to improve the feeding habits of children with feeding issues. Howe and Wang (2013) conducted a systematic review of the interventions used in occupational therapy practice when treating children with feeding difficulties from birth to five years old. They found that behavioral intervention is effective with different diagnoses and settings increasing the feeding competence of children.

Another systematic review was conducted by Gronski and Doherty (2020) to which provided a broad perspective on evidence-based practice in the scope of OT used to improve the functional performance, routines, and quality of life of young children with feeding, toileting, and sleep issues along with the performance, routines, and quality of life of their caregivers. Focusing on the eating subsection, Gronski and Doherty found that repeated exposure to non-preferred foods with and without modeling and various types of rewards was effective. They also found that outcomes related to food acceptance were most improved with tangible rewards and repeated exposure paired together. This systematic review also focused on parent training, and they found that the best parent practices that improve parent mealtime stress included behavioral approaches with positive reinforcement, response fading, and task chaining.

Caldwell et al. (2018) conducted a study using a behavioral activation approach to parent training for the feasibility of promoting routines of exploration and play during mealtime. The objective of this study was to help parents with young children adopt healthy routines using a behavioral activation approach to train parents of children with

sensory food aversions. Two out of three of their feasibility benchmarks were met and they concluded that using a behavioral activation approach to parent training shows a promise for altering daily mealtime routines.

Methodology

The research question we pose is: how does occupational therapy play a role in improving family mealtime experience by increasing independence and acceptance of novel foods with the least time, money, and energy expenditure from the parents and caregivers? To answer this question, we created educational handouts that will consist of evidence-based information that parents could use to help improve mealtime experiences in young children. To begin the process, the team individually searched for evidence-based interventions through the databases CINAHL Complete, PsychINFO, Medline, Academic Search Complete, Google Scholar, and PubMed. Keywords that were searched include “feeding intervention + OT,” “feeding aversions + OT,” “picky eating,” and “picky eating interventions,” were used. This research was used to see which interventions resulted in positive mealtime experiences. The design of the research articles was a mix of qualitative and quantitative. The advantage of having mixed designs is to be inclusive of parents’ perspectives and effective interventions. We narrowed down our articles that specifically focused on general picky eating, sensory processing disorder, autism spectrum disorder, and oral motor.

A partnership with NJA Therapy Services provided insight into our target population from toddlers to elementary school-aged children, their interactions and support to parents and caregivers being involved and part of therapy sessions, and the emphasis on making sure the children are having fun during therapy. Partnering with

NJA Therapy Services allowed us to have the most optimal approach to answering our question of how occupational therapy plays a role in improving the family mealtime experience. This was approached by increasing independence and acceptance of novel foods with the least time, money, and energy expenditure from the parents and caregivers. The strategies that are provided in the handbook prove to have strong levels of validity and reliability as the critically appraised ideas are both evidence-based and non-biased.

With NJA Therapy Services guiding the team, these handouts would be shared with clients and families receiving OT feeding interventions. To develop and create the home feeding program, images that had cartoons and appealing to a pediatric population were chosen online, or hand drawn. If the child fits the criteria of feeding difficulties, the handbook will be given and explained to the parents or caregivers.

The educational handouts will cater to a target population of caregivers with children ages two to ten with certain food aversions, specific populations, and oral motor issues. Each of the handouts would include the following: a description or definition based on evidence-based literature, signs and symptoms, specific OT intervention strategies, literature references, and a food diary log. Once we have delineated the age levels, targeted population, and specific OT interventions, we have developed and created the following sections for our handouts: Oral Motor, Picky Eating, Play Based intervention, Food chaining, Family-centered care, autism spectrum disorders, and Sensory Processing Disorders.

Oral Motor Handouts

Feeding can be defined as the act of preparing and bringing food or fluids from the table to the mouth. Oral motor skills are needed to carry out the transition from feeding to eating. Oral motor issues are more easily identified by choking or gagging but may also be present in different ways. Children may have difficulty with holding a spoon, scooping, bringing the spoon to their mouths, or advancing textures (Manno et al., 2005). The more common issues associated with feeding difficulties typically involve oral motor problems such as uncoordinated tongue movements, decreased lip strength, and jaw instability. Difficulties with feeding are very common and, according to a study conducted by Benjasuwantep et al. (2013), are found in 20-50% of normally developing children ages 1 through 7, and in 70-89% of children with developmental disabilities. Feeding and oral motor difficulties can be caused by a multitude of diagnoses including developmental disabilities such as autism, cerebral palsy, down syndrome, fetal alcohol and drug-related syndromes, genetic disorders, and intellectual disabilities. Other diagnoses that can cause oral motor difficulties are sensory issues, structural abnormalities, and behavioral factors. It is important for caregivers to look for some common signs of trouble with feeding and swallowing. The following signs include, but are not limited to, crying or fussing when feeding, falling asleep when feeding, problems with breastfeeding, arching back or stiffening up when eating, having trouble breathing while eating or drinking, coughing or gagging during meals, or not gaining weight or growing. Feeding behavior can be improved by educating caregivers on the administration of oral motor stimulation for their infants as a measure of family centered care (John et al., 2018). Having the ability to recognize these signs early on in a child's

life and intervening with specific strategies will decrease their chances of developing lifelong feeding issues.

An occupational therapist's role in treating oral motor issues is to evaluate the client, treat posture, tone, oral motor, oral sensory, and self-feeding, educate caregivers and families, develop a plan of treatment, and continue to encourage their clients to the best of their ability. The oral motor skills vital to a successful mealtime integrate tongue retraction, tongue lateralization, tongue awareness, and lip closure (Hiiemae & Palmer, 2003). Tongue retraction is the pulling back of the tongue into the posterior portion of the oral cavity and it is associated with abnormally increased muscle tone. Parents can have children drink through different types of straws in order to improve tongue retraction by making the client aware of their tongue activity during the use of a straw. Tongue lateralization is needed to manipulate most food textures, as well as helping to support the development of a mature chewing pattern. Interventions that can be implemented by caregivers at home to improve tongue lateralization include eating lollipops or modeling funny faces for the child to imitate in a mirror. Children can rub the lollipop in both corners of their mouths, and then lick off both corners in order to get their tongues to move side to side. Tongue awareness can be improved by simply introducing the child to foods with various spices, sour flavors, cold foods, or peanut butter.

Lip closure is important for feeding because it creates positive pressure for bolus propulsion, decreases drooling, and it is required for straw drinking (Hiiemae & Palmer, 2003). Activities for improving lip closure include blowing through a straw to move light objects around a game board, giving kisses on their hands, or closing their lips around a lollipop and squeezing. To prepare a child for spoon feeding, parents can create fun

activities such as filling a bowl with sand and gold coins and having their child scoop through the sand to find the coins and transfer them to another bowl. This activity allows a child to work on their grasp patterns and exposes them to different textures.

Picky Eating Handouts

Picky eating is a type of behavior that people of all ages may experience but is prevalent in early childhood development. There are alternative terms used to describe picky eating such as fussy eating or selective eating. Although there is not definitive definition to this behavior, this can be observed as a child rejecting or restricting familiar or unfamiliar foods. This can result in parents' concern that the child may experience malnutrition which may translate to health and development (Taylor & Emmett, 2018).

As parents are concerned about this type of behavior, it is important to understand how it begins. Schwartz et al. (2011) highlighted 3 important factors that are key to the development of picky eating. There is the "when", "how" and "what". The "when" refers to the timing of when new foods are introduced. The "what" refers to the variety of novel foods that the child is being introduced to. Lastly, the "how" is the parent-child interaction of the introduction of new foods. Emmett et al. (2018) conducted a study to investigate early life factors that can lead to picky eating behavior. The parents were recruited from a group called the Avon Longitudinal Study of Parents and Children. They completed a questionnaire about picky eating from their child's first 2 years of life and at 3 years old. The results showed that feeding practices that failed to introduce lumpy food at 9 months, anxiety from the mother being worried about picky eating behavior, and not eating with the child contributed to the likelihood of picky eating. Therefore, this study

advised parents to introduce lumpy foods at 9 months, eat their meals with their child, and to be reassured that being choosy is normal.

Play-Based Therapy Handouts

Play is a key occupation of a child and a means for occupational therapists to reach functional goals. It is used as a means by which the child can learn, develop and socialize (Myers & Cason, 2020). Using play-based therapy to help decrease picky eating behavior has been used by occupational therapists. An intervention that is play-based includes playing with toys that mimic various food groups and drawing or painting food helps reduce resistance to eating solid food items. Play-based therapy also included the use of storytelling, in the form of "social stories", to facilitate mealtimes and exposure to a variety of food. This strategy significantly reduced anxiety and willingness toward non-preferred food (Haroon, 2019). Play can be a motivator for children to engage with foods that they are unfamiliar with. As they get more exposure and familiarize themselves with various food groups, it can help with integrating them into their diets.

Food Chaining Handouts

Food chaining is an intervention that starts with the preferred food item and slowly integrates to non-preferred food items that have similar ingredients or taste. A study conducted by Fishbein et al. (2006) focused on 10 children who were referred to a feeding program for evaluation of food aversion. Each subject had an extreme food aversion that was used for food chaining. The parent, child and therapist then establish a targeted food item. For example, a child who prefers French fries will be introduced to waffle fries, tater tots or hash browns then potato wedges with different sauces then baked potato with sour cream. As the child accepts the different food selections, they will

ultimately try the targeted food item which could be chicken pot pie. The study was done for at least 3 months and resulted in an increase in food selection. It is important for parents and caregivers to understand that although this study was done in 3 months, each child's progress may be different. Patience is key with food chaining but has been shown to be effective compared to other food interventions (Fishbein et al., 2006).

Family-Centered Care Handouts

Picky eating behaviors are heavily influenced by environmental factors which include role-modeling of normal eating behaviors, exposure to new foods and positive mealtime experience. Family-centered care revolves around behaviors from the therapist such as active listening, respect, and empathy. They also allow participation from the family members that respond to the family's needs and priorities by engaging them in the intervention. Incorporating family- centered care was highly related to the family's self-efficacy beliefs, parents' satisfaction, parenting behaviors and child behavior and functioning (Kuhaneck & Case-Smith, 2020). Parents or primary caregivers play an essential role in the child's ability to overcome picky eating. There is a parent-child interaction that occurs when it comes to picky eating. Using pressure, restricting certain food or using food as a reward result in negative behaviors. A parent's or caregiver's role in nutritional behavior is to provide mealtime structure of when and where the child will eat their meal. There should be positive interaction during mealtimes and the child should be able to feed him or herself a variety of food. The child's role is to choose whether they want to eat when food is given, be able to choose from a variety of foods and to stop eating when they are full (Tseng et al., 2009). Positive mealtime experiences occur when the parent does not scold the child when they are not eating and not forcing them to eat.

Role-modeling can occur by having the family eat the same foods with the child while modeling appropriate responses. Giving a variety of food groups with different tastes such as sweet, salty, or sour will allow the child to pick and explore the different tastes.

Sensory Processing Disorder Handouts

Sensory processing issues can create many challenges for children during mealtime experiences. Due to problems registering sensory information in their external environment, children with sensory processing issues might experience challenges responding to various food textures, smells, tastes, colors and even the sounds created from chewing. Once the child's sensory processing issue is determined, the child can then be exposed to various sensory experiences which increase familiarity, curiosity, and acceptance of novel foods as a result (Moding et al., 2020).

Tactile hyper-responsiveness is a term used to describe an overreaction to touch sensations (Autism Speaks, 2020). Children that are hyper-responsive to touch sensations often experience aversions to a variety of food textures. Gustatory hyper-responsiveness refers to sensitivity to various tastes of food. Children with this sensory sensitivity might be aversive to bitter, salty, spicy, or overly sweet-tasting foods. Olfactory hyper-responsiveness is a term used to describe an extreme sense of smell (Autism Speaks, 2020). This can cause children to be aversive to certain food smells and can even increase their sensation of taste, producing an even greater aversion to that food item (Davis et al., 2014). Lastly, auditory hyper-responsiveness refers to hearing sensitivities. Children with this sensory processing issue might experience aversions to hard, crunchy, or chewy food items because of the sounds that they produce as they are chewed. Although each of these sensory systems can experience issues independently of one another, ineffective sensory

processing can occur in multiple systems. In these educational handouts, several strategies will be outlined for families to implement throughout their routines in order to help increase effective and adaptive sensory responses to new or previously aversive foods.

Nederkoorn et al. (2018) conducted a study to evaluate whether tactile exposure to an aversive food texture increased acceptance of that food. In their randomized experimental study, 66 children between ages 3 and 10, were randomly assigned to either the exposure or control group. The exposure group were to play with jelly with their hands and the control group played a board game with their hands. Each group was then asked to taste 3 different desserts: strawberry yogurt, strawberry yogurt with pieces, and strawberry jelly. The children assigned to the exposure group were found to eat more of the jelly dessert. These results suggest that allowing children to play with the aversive food before attempting to taste it can be a successful intervention for increasing acceptance to new food textures (Nederkoorn et al., 2018). Hawkins et al. (2020) conducted a quasi-experimental study to further explore how tactile play can impact a child's oral acceptance of wet food items. Hawkins et al. found that children that played with wet non-food items were more likely to interact and place wet food items into their mouth after play. If a child experiences aversions to chewy food textures such as bread, noodles, or meats, incorporating tactile play exploration with these foods, or similarly textured non-food items, can improve their level of acceptance.

Furthermore, the MealSense sensory integration-based feeding program stresses the importance of not only incorporating exploratory play, but also the child's interests in facilitating positive experiences and greater acceptance of new foods (Trewin et al.,

2022). An example of this might involve cutting chicken into the shape of the child's favorite animals and facilitating a tactile game with them before tasting the chicken during mealtime. Allowing a child to help in the meal preparation, even if they are not ready to taste it yet, is also a great way to increase their curiosity of new foods. These positive tactile play experiences can increase acceptance to specific food textures, smells, and tastes.

The play-based strategies highlighted above can also be applied to those with olfactory sensitivities. Incorporating various smells into the child's play routine can help increase their acceptance. Increasing their exposure to different scents in a playful and judgment-free zone can help increase their olfactory tolerance in a safe environment. Once the child has an increased acceptance to various scents, involving them in the meal preparation and allowing them to smell each ingredient while modeling positive responses can help increase their curiosity of food smells.

The play-based strategies highlighted above can also be applied to gustatory hyper-responsiveness. The SOS approach provides evidence for the fact that children that play with wet non-preferred food items are more likely to accept the non-preferred food item when placed in their mouth after playing (Hawkins et al., 2020). This approach has been found to be effective as increasing acceptance along a hierarchy towards non-preferred wet food items.

Introducing foods to picky eaters in a hierarchy (least aversive to most aversive) and incorporating tactile play with non-preferred food items has been found to be an effective intervention for sensory processing issues that are resulting in picky eating (Hawkins et al., 2020). The strategies outlined above can be utilized in the home and

incorporated into the family's daily routine to help increase acceptance to more food items and decrease negative mealtime behaviors.

Autism Spectrum Disorder Handouts

The feeding needs and difficulties associated with ASD will also be addressed in these educational handouts. *The Diagnostic and Statistical Manual of Mental Disorders* characterizes ASD as a diagnosis in which the individual has persistent deficits in social communication and social interaction across multiple contexts manifested by deficits in social-emotional reciprocity, nonverbal communication, and developing, maintaining, and understanding relationships (American Psychiatric Association, 2013). An ASD diagnosis also consists of restricted, repetitive patterns of behavior, interests or activities manifested with stereotypes repetitive motor movements, use of objects, or speech, insistence on sameness, highly restricted fixated interests, and hyper- or hyperreactivity to sensory input such as indifference to temperature changes or pain and adverse responses to specific sounds or textures. When it comes to different foods and food textures, an ASD diagnosis can significantly impact feeding behaviors and preferences (Harris et al., 2021). The associated ritualistic tendencies, sensory sensitivities, and inflexible natures lead to food selectivity in some children with ASD (Zickgraf et al., 2020).

Occupational therapists approach feeding difficulties in children with ASD in many ways. Play is an occupation used as a means to reach eating milestones. Suarez (2017) found that children with ASD select significantly fewer total foods when compared to typically developing children except for snack foods. Since children with ASD have difficulties with changes in routines, it would be important for the

occupational therapy intervention to involve the child's routines and slowly expose them to different foods starting with snack foods. This can be done through a play-based routine in which the child is comfortable. Using Suarez's finding of children with ASD widely accepting snack foods, it's important to incorporate snacks into the play interventions. A sample activity can be included in the handouts in which the child's favorite foods are incorporated. This play-based intervention could be a game involving a blindfold and a selection of foods that the therapist or caregiver would feed the child and have them guess what the food item is. This is a play-based intervention that involves the child's favorite snacks to build trust and provides an opportunity to introduce new foods.

Occupational therapists address food selectivity in children with ASD using sensory-behavioral, family-focused, and other specific interventions (Reche-Olmedo et al., 2021). Sensory behavioral interventions are used to specifically improve the acceptance of new foods, or the total grams of food consumed, reduce inappropriate mealtime behavior, improve mouth cleaning, and reduce the presence of packing, gagging, and spitting out food. All of these are concerns parents have and may want to address in the home. This can be translated to the handouts in the form of an at-home sensory-behavioral intervention. An example of a home-based sensory-behavioral intervention we included in our handouts is a play-oriented game in which the therapist or caregiver would reward the child every time they eat new food or demonstrate good mealtime behaviors.

Family-focused interventions provide parents with basic skills to manage food selectivity, implement new tools to reduce food selectivity, and improve the acceptance of food consumed (Kuschner et al., 2017). One specific family intervention started by

Kuschner et al. is the Building Up Food Flexibility and Exposure Treatment program (BUFFET). This is a 14-week multi-family group cognitive behavioral treatment used for selective eating in children with ASD ages 8-12. The first six sessions consist of psychoeducation in which parents are actively involved in all treatment sessions. The children focus on building skills for managing anxiety and increasing flexibility.

Cognitive behavioral therapy is used to restructure negative thoughts called “Food Foe Thoughts" into constructive positive thoughts called “Food Friend Thoughts.” The children participate in BUFFET Building in which they expand the buffet of foods they are willing to try to eat by working with their parents. This can include a plan with steps as small as touching the food to eating a whole piece. Parents report general satisfaction with the BUFFET procedure. Aspects of this method can be applied to our handouts. We would include the two concepts of food for thoughts and food friend thoughts to include a cognitive behavioral approach in the handouts. This is a child-friendly way to get the children to think about the way their thoughts are affecting their eating patterns.

Limitations

The evidence-based educational handouts do not replace individualized OT intervention services for feeding challenges in young children. The handouts are only accessible to families who are receiving services at NJA Therapy Services. A potential adverse effect may present if families are not able to understand the material provided on the handouts and therefore cannot utilize the strategies effectively. There may be limited time for a proper demonstration of strategies presented in the handouts in one therapy session alone. A potential conflict of interest is having the owner of NJA Therapy

Services as the advisor leading this thesis project. Limited strategies or similarity in strategies in most of the sections of the handouts.

Ethical and Legal Considerations

Inclusivity is an important consideration to ensure the language, content, graphics, and illustrations are inclusive of people of all different backgrounds. Accessibility is also important to consider in terms of expense. We will ensure these handouts are easily accessible for the clients of NJA Therapy Services. Information dissemination was important when we developed and created this project to ensure knowledge is being shared with those receiving occupational therapy services for feeding issues. Guided by the AOTA's ethical principles we took into consideration the following ethical values: non-maleficence, veracity, and beneficence (AOTA, 2020a). Non-maleficence is refraining from causing any harm brought about by the information provided in the handouts. Veracity is the process of providing comprehensive, accurate, and objective information. We made sure that the information, intervention, and strategies included in the handouts were accurate, correct, evidence based, and easily understood and resourced. Beneficence is the demonstration of concern for the well-being and safety of others. This was a very important driving factor for the creation of these evidence-based OT feeding handouts to enable and empower parents and caregivers in checking for the child’s feeding welfare and safety.

Contributions to Occupational Therapy

The development and creation of these evidence-based educational feeding handouts for caregivers and children will aid in the translation of OT services to a home environment and thus may improve the quality of life for parents and children

experiencing feeding difficulties. Implementing these evidence-based OT feeding handouts may contribute to improving parent self-efficacy, management of the child's sensory processing, feeding issues and challenges, and the family's overall mealtime experiences. Increased children's acceptance of novel foods and decreased parent stress level is also a benefit of the evidence-based educational feeding resources. It is important for occupational therapists to provide supplemental home-based therapy strategies such as these OT feeding handouts because there is limited time in a one-hour therapy session to provide proper education and training. Caregiver demonstration, training, and education ensure that the child is receiving consistent therapeutic attention as part of the service translation as provided by OT in the center to the child's home. Occupational therapists should take a family-centered, and top-down approach when treating children for optimal therapeutic benefit. It is important to increase caregiver involvement and provide feedback sessions prior to initiating educational resources to ensure understanding of the materials and their safety implementation.

Conclusion

Feeding habits play an intricate role in our development from birth to adulthood. During the first two years of life, children move through detailed stages where new foods are introduced as they develop the skills needed to suck, chew, and swallow different types of food. Organizations such as the CDC and the American Academy of Pediatrics provide guidelines and feeding milestones for typically developing children. Unfortunately, there are many disorders that hinder the development of feeding milestones and can result in nutritional, medical, and psychosocial dysfunction (Goday et al., 2019). Occupational therapists play an important role in helping individuals

diagnosed with food aversions and feeding challenges. Behavioral, parent-directed, educational, physiological, and sensory-based approaches are the most common OT-related interventions that exist today. Although these OT interventions have been found to be very successful in addressing feeding challenges, there is still a lack of information dissemination on this topic of interest. Without adequate education provided on typical developmental feeding milestones, warning signs, and prevention strategies, many new parents are often unprepared in regard to what to expect in typically developing versus atypically developing children. As a result, they tend to misread warning signs and symptoms that might arise which leads to nutritional deficiencies and problematic mealtime behaviors.

The development and creation of these evidence OT feeding handouts helps to mitigate these developmental feeding challenges and provide more information to every new or existing parent dealing with these issues. In these evidence-based OT feeding handouts, it is also important to highlight the successful integration and implementation of OT intervention approaches for these populations. As part of these handouts, OT resources are also included. Recognizing and addressing feeding challenges and aversions as early as possible provides the best chance for a successful intervention as feeding plays a vital role in each of our lives.

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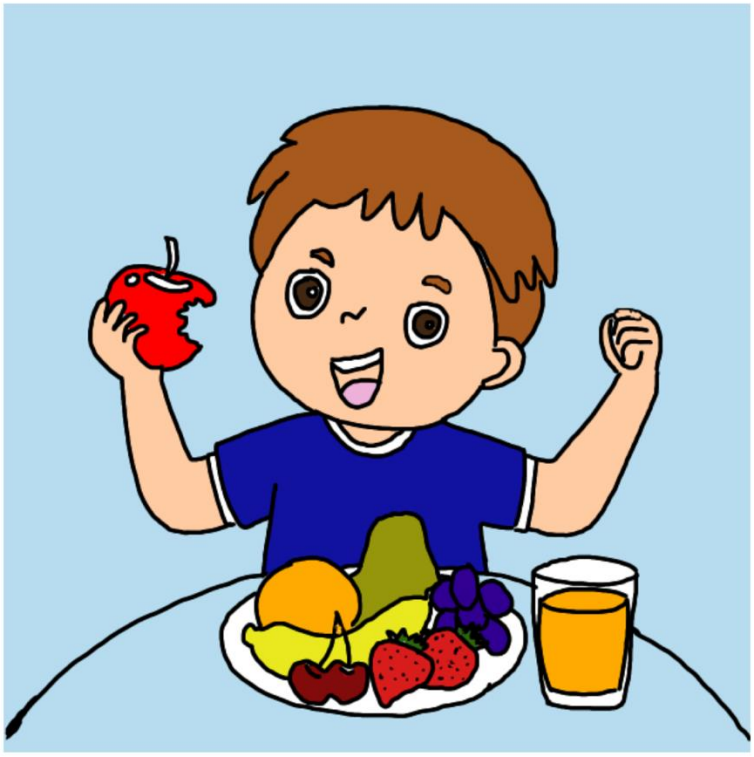
Appendix A

Occupational Therapy Home Feeding Handouts

Feeding Handouts for Picky Eating



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NJA THERAPY SERVICES, INC.
Redefining Child's Independence

Developmental Feeding Milestones

Eating habits starting at birth significantly impact patterns related to food in childrens' futures. Most children roughly follow a pattern of feeding milestones which help guide them to have healthy relationships with food.

(Center for Diease Control and Prevention, 2021), (Hernell & Schmitts, 2005), (Butte et al., 2004), (American Acedemy of Pediatrics, 2021), (Pathways, n.d.), (Children's therapy and Family Resource Center, 2011)

Birth to 6 months	Breastmilk or formula 2-6oz. 6x/day
4-6 months	Puréed foods in a smooth/thin consistency. Ex: carrots, apple, green beans, squash
7-9 months	Solid bite sized foods or mashed foods. introduce a variety of textures. Ex: sweet potatoes, green beans, well-cooked pasta

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Developmental Feeding Milestones

10-12 months	Drink from a cup, variety of foods, finger feed. Ex: soft cooked foods, scrambled egg yolks, beans/legumes, ground meat, strips of cheese, bread, toast, crackers.
13-18 months	Self-feed using utensils. Should eat most foods by this age and participate in family mealtimes.
24 months	Swallow drinks from an open cup with minimal to no spilling, and swallowing foods with no spillage.
2-3 years old	Eat the same foods as the rest of the family, use utensils well, wipe their own mouths, and serve themselves.

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What are Oral Motor Skills?

Oral motor skills refer to the function and coordination of the muscles in the mouth, lips, cheeks, and jaw
(Manno et al., 2005).

Common Areas of Oral Motor Dysfunction:

Jaw Instability

Lip Closure

Tongue Movement

Fine Motor Skills

What Does Jaw Instability Look Like?

A child with low muscle tone in their facial muscles can have trouble controlling the movement of their jaw. This can affect the strength of the child's bite and how wide they can open their mouth, which results in difficulty with chewing and manipulating food in the child's mouth
(Manno et al., 2005).

What can be done to help?

Use flexible and firm chew toys to help strengthen and stabilize the jaw. Chews have different resistances to choose from.

Parent can place hand on child's jaw to give them the sensation of jaw stability. This will also help the child get a feel of what up and down jaw movements should feel like.

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What Does Poor Lip Closure Affect?

Lip closure is important for feeding because it allows for forming food into a ball within the mouth, decreases drooling, and it is required for straw drinking

(Hiiemae & Palmer, 2003).

What can be done to help?

Have child round their lips around a lollipop and squeeze 3-5 times. This will help build strength in the lips.

Blowing bubbles allows the child to develop the skills necessary for proper lip closure.

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Why is Tongue Movement Important?

The oral motor skills vital to a successful mealtime involve tongue awareness, moving the tongue side-to-side, back and forth, and up and down.
(Hiiemae & Palmer, 2003)

What can be done to help?

Place a dab of pudding on the corners of child's mouth and have them lick it off with the tip of their tongue. This helps the child work on moving their tongue side-to-side.

Place a cheerio on the tip of child's tongue and have them touch it to the roof of their mouth, right behind their front teeth, for as long as they can. This will help build skills for moving tongue up and down.

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How Can Poor Fine Motor Skills Affect Mealtime?

Children may have difficulty with holding a spoon, scooping, and bringing the spoon to their mouths.

(Manno et al., 2005).

What can be done to help?

Fill a bowl with sand and gold coins. Have child scoop out coins into a separate pan. This allows the child to practice different grasp patterns while exposing them to different textures.

Have child use their fingers to pull small beads out of putty. This activity will help to increase finger strength and grip.

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My Food Diary Log

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What is Picky Eating?

Picky eating can be observed as a child rejecting or restricting familiar or unfamiliar foods. Alternative terms used to describe picky eating can be *fussy eating* or *selective eating*
(Taylor & Emmett, 2018).

Let your child help with making food!

Make food fun!

Have a mealtime routine!

Make the mealtime experience positive!

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What is ARFID?

ARFID stands for Avoidant/ Restrictive Food Intake Disorder

This is defined as children who are extremely picky eaters and have little interest in eating food. They have a limited variety of food that can lead to poor growth and poor nutritional outcomes

(Sherman, 2021).

Signs that your child may have ARFID

- Significant weight loss
- Abdominal pain
- Fatigue
- Fear of choking or vomitting
- Excess energy
- Only eat foods with particular texture
- No fear of gaining weight
- No body image struggles
- Cold intolerance

(Gans, 2022)

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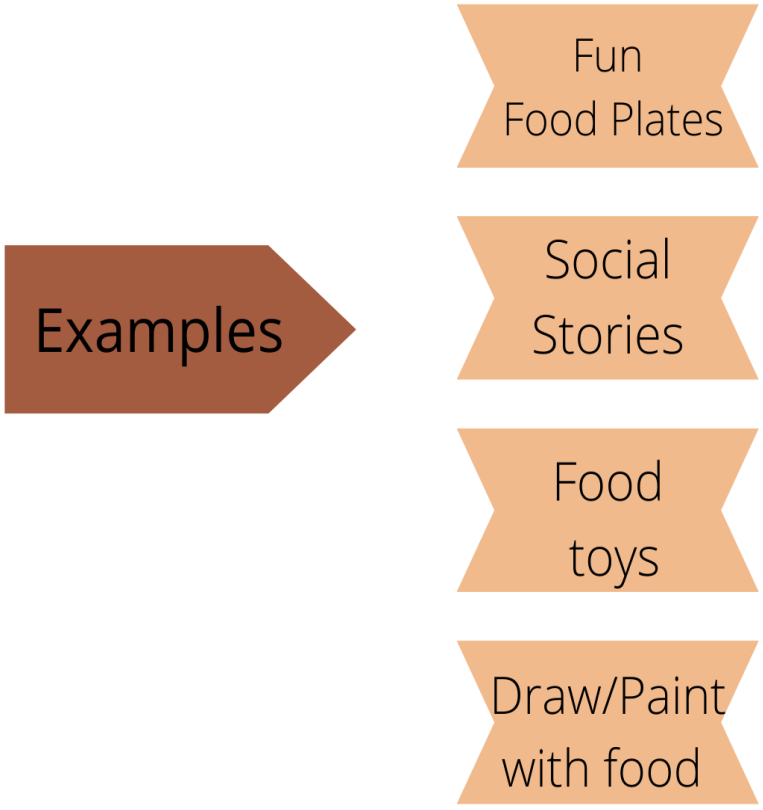
Strategies to help:

Play-Based Approach

Playing with toys that mimic various food groups, and drawing or painting with food helps reduce resistance to eating solid food items. This strategy significantly reduces anxiety and increases willingness to try non-preferred foods (Haroon, 2019).



Fun Food Plates

Use fruits, sandwiches, crackers, etc!

Create animals and silly faces!

Make food look fun and delicious!

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Social Stories

Social stories are previews that prepare a child for what to expect and how to feel prior to a new experience. It may include pictures and captions and can be just about anything you think of!

(Puzzuoli, 2016)

Different foods have different textures or tastes. There are also lots of different ways to cook, prepare, and/or serve a piece of food. That means, a piece of food can taste different every single time I try it.

I won't know if I like something though until I give it a taste, lick, or bite. Even if it looks weird, funny, or gross, I should at least give it a try.

I might be hesitant or scared to try a new food because it's unfamiliar to me or it looks gross. I might wonder does it taste sweet or spicy? Will I like it? Will it be crunchy or soft? The only way to know is to give it a try.

There are lots of foods that I've never eaten or tried before. Since my taste buds are always changing, it can be fun to try new foods. A food that I didn't like before might taste good to me the next time I try it. Who knows, I might even find a new favorite.

Adapted from *And Next Comes L*, by Dyan Robson, n.d., (https://www.andnextcomesl.com/2020/05/free-printable-trying-new-foods-social-story.html). Copyright 2022 And Next Comes L- Hyperlexia Resources. Reprinted with permission.

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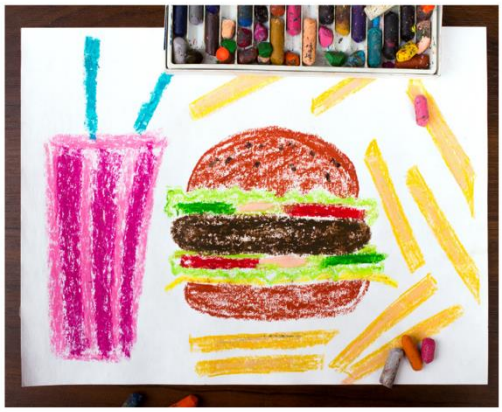
Food Toys

Food Toys can be bought at your local store!

Amazon
Walmart
Target
Dollar Tree

Arts and Crafts with Different Foods!

Engage with different food groups and make it fun!



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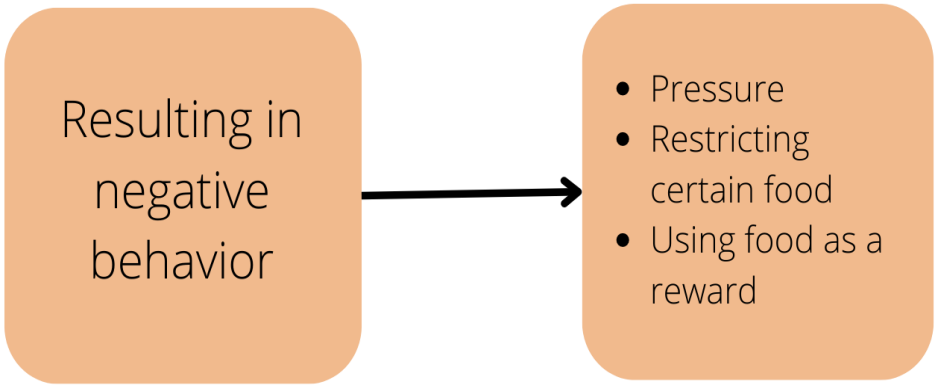
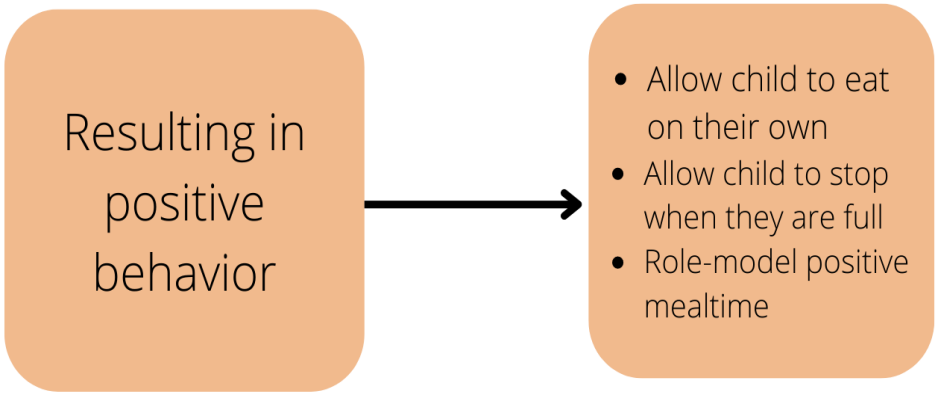
Family-Centered Care

Picky eating behaviors are heavily influenced by environmental factors which include role-modeling of normal eating behaviors, exposure to new foods, and positive mealtime experience.

There is a parent-child interaction that occurs when it comes to picky eating. Interactions that can result in:





(Tseng et al., 2009)

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Family-Centered Care

Let your children help you when making meals!

Establish a mealtime routine and create a positive environment!

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Food Chaining

Food chaining is a child-friendly approach that introduces new food while building on the child's past successful eating experiences
(Wagner et al., 2020).

Chicken Nugget to Tilapia

chicken nuggets

different chicken nuggets

homemade nuggets

homemade fish sticks

minimal breading on fish stick

cooked tilapia

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My Food Diary Log

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What is Autism Spectrum Disorder?

A child who has Autism Spectrum Disorder (ASD) has persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following:

Social emotional reciprocity

Nonverbal communication

Developing, maintaining, and understanding relationships

(American Psychiatric Association, 2013)

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What is Autism Spectrum Disorder?

A child with ASD also presents with restricted, repetitive patterns of behavior, interests, or activities, with at least two of the following:

Stereotyped or repetitive motor movements, use of objects, or speech

Insistence on sameness, inflexible adherence to routines, or ritualized patterns

Highly restricted, fixated interests that are abnormal in intensity or focus

Hyper or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment

(American Psychiatric Association, 2013)

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Autism Spectrum Disorder

Food Aversion

Hypersensitivity to texture is often a concern with children who have Autism. This leads to children having difficulty expanding the types of food they eat.

Signs that your child may be experiencing food aversion

- commonly left over food
- overreacting to a specific food
- consistently crying, falling apart, or shutting down when exposed to new foods
-eats less than 20-30 total foods
- consistently vomiting during or after eating
- has difficulties controlling food in the mouth
- takes longer than 35-40 minutes to eat a meal
- refuses entire categories of food textures or nutritional groups
- presents as congested while eating

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ASD and Food Aversion

Restricted behaviors, insistence on sameness, inflexibility, and hyper/hypo-reactivity to sensory input all impact the child's relationship with food.

Hyperreactivity
Hypersensitivity

Children with ASD can be over responsive to certain sounds, sights, smells, tastes, touch, balance, awareness of body positioning, body cues, and sensations

Sensory Avoidance

Children with sensory avoidance try to refrain from these stimuli which can look like picky eating or refraining from certain smells, textures, and tastes of foods. These children tend to avoid foods that are crunchy, chewy, wet, dry, sticky, mushy, and lumpy.

(Autism Speaks Inc., 2022)

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ASD and Food Aversion

Hyporeactivity
Hyposensitivity

These children are under responsive to sensory stimuli and may have trouble recognizing sensations like taste and even hunger.

Sensory Seeking

This leads to sensory seeking behaviors such as only eating foods with strong flavors.

(Autism Speaks Inc., 2022)

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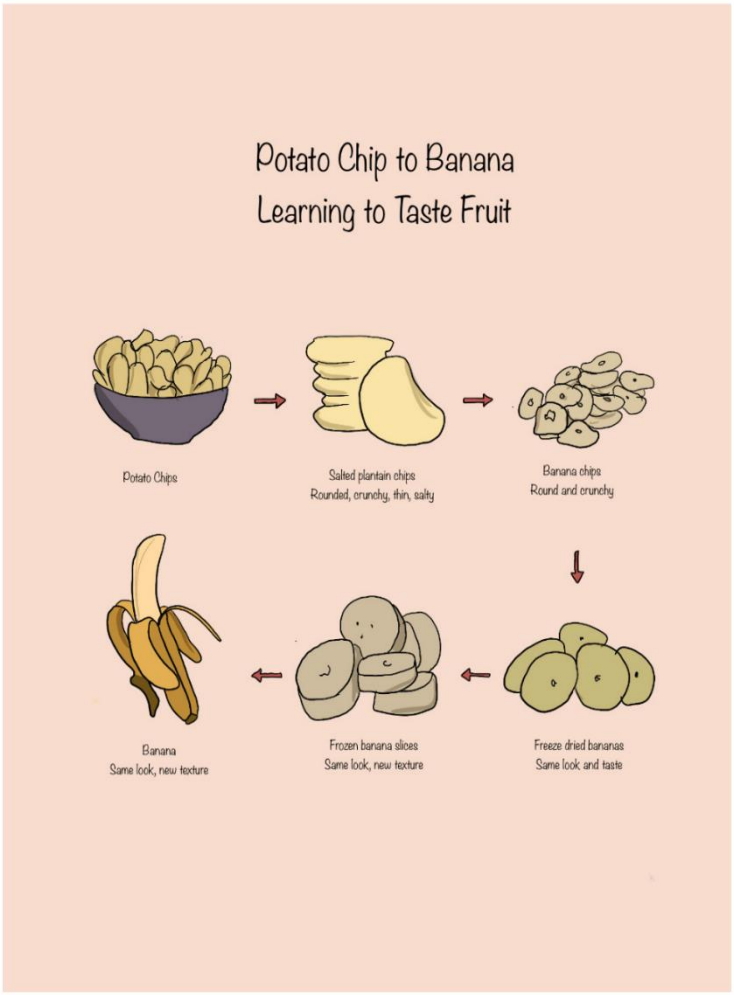
Food Chaining

Food chaining is a 6-step plan to stop picky eating, solve feeding issues, and expand your child's diet. The key is to start with the preferred food item and slowly integrate non-preferred food items that have similar ingredients or taste. Patience is key with food chaining, but has shown to be effective compared to other food interventions

(Fishbein et al., 2006).



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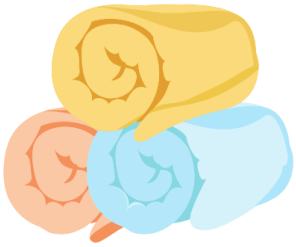
Supporting Posture

Children with autism have weakness in their cores (stomach and back). Some also have poor body awareness, meaning they aren't very aware of where their body is in space. This can lead to poor posture when participating in mealtime, which in turn produces discomfort with feeding. Providing postural support can help your child focus on eating.

If your child's feet don't reach the ground when eating, it can be helpful to provide support under the feet in order to help your child feel grounded. This can help stabilize their posture, helping them direct their attention toward the food in front of them instead.

If your child is slouching, leaning, or moving around in their seat when eating, you can place rolled towels around the back and hips to provide additional support to aid in the child's posture. This can help your child gain a sense of trunk (core) control.



(Autism Speaks, 2015)

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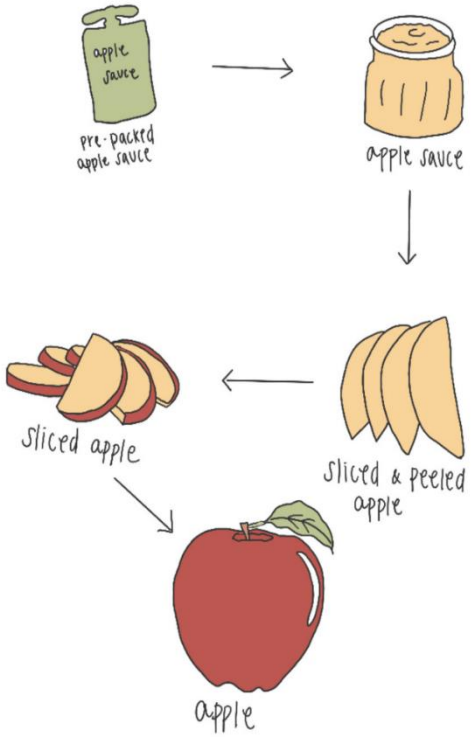
Gradual Exposure

Children with autism can be fearful of certain foods due to their color, texture, smell, etc. For example, some children tend to refuse all red foods, or don't like apples because they feel "wet". It is important to expose these children to foods gradually instead of overwhelming them. Here is an example of how to gradually expose a child who doesn't like red foods to an apple.



(Autism Speaks, 2015)

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Playing with Food

Children learn a lot through play. When you allow your child to play with their food and be a part of the food making process, you are exposing them to different textures, smells, and experiences that are different than just the eating process. This can spike your child's interests in food and build a foundation that allows for a better relationship with food and greater comfort with eating

(Autism Speaks, 2015)

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My Food Diary Log

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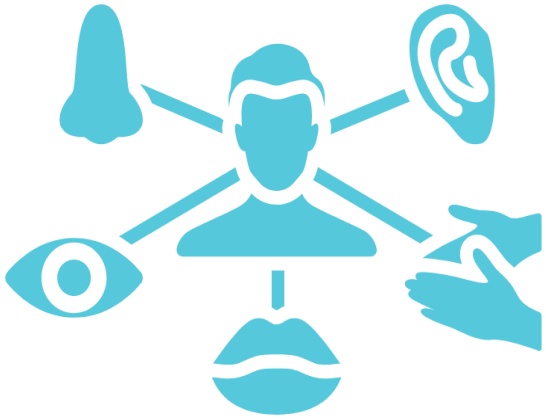
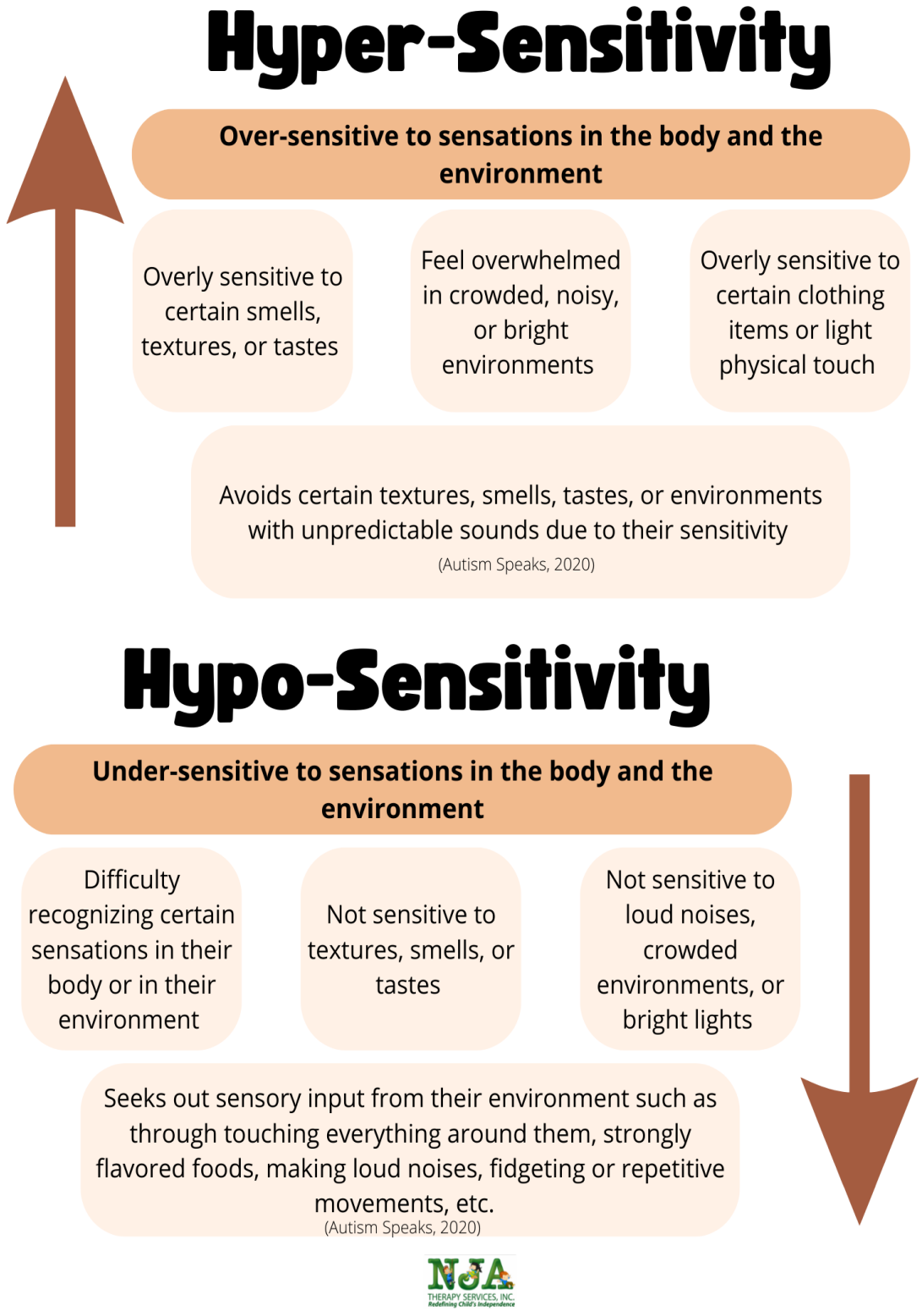
What is Sensory Processing Disorder?

Our sensations of touch, taste, smell, sight, sound, balance, and awareness of our body's position are regulated by the sensory systems in the brain. Sensory integration is the process by which the brain organizes the sensations in our bodies, as well as from our environment, in order to participate effectively in the world around us (Ayres, 1972). When one or more of these sensory systems are not functioning properly, a diagnosis of sensory processing disorder might result (Galiana-Simal et al., 2017). Individuals diagnosed with sensory processing disorder might experience over-sensitivities to specific sensations, under-sensitivities to specific sensations, or a combination of these two across many sensory systems in the body. This disorder can create challenges for individuals in all areas of their life and impact their learning, behavior, socialization with peers, body coordination, language, eating, dressing, bathing and grooming, and engaging in various activities in their environment.




Hyper-Sensitivity
Over-sensitive to sensations in the body and the environment
Overly sensitive to certain smells, textures, or tastes
Feel overwhelmed in crowded, noisy, or bright environments
Overly sensitive to certain clothing items or light physical touch
Avoids certain textures, smells, tastes, or environments with unpredictable sounds due to their sensitivity
(Autism Speaks, 2020)
Hypo-Sensitivity
Under-sensitive to sensations in the body and the environment
Difficulty recognizing certain sensations in their body or in their environment
Not sensitive to textures, smells, or tastes
Not sensitive to loud noises, crowded environments, or bright lights
Seeks out sensory input from their environment such as through touching everything around them, strongly flavored foods, making loud noises, fidgeting or repetitive movements, etc.
(Autism Speaks, 2020)
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Hyper-Sensitivity to Touch

What does this look like?

Children that have hyper-sensitivity to touch sensations often experience aversions to a variety of food textures. This means that the child might be aversive to crunchy, chewy, wet, dry, sticky, mushy, or lumpy textured foods
(Autism Speaks, 2020).

Strategies to help:

Play exploration with textured food items can increase a child's curiosity and acceptance to new foods
(Nederkoorn et al., 2018).

child plays with the aversive food item in their hands without any pressure to eat it → child tries bringing the aversive food item to their lips without having to eat it → child tries placing the aversive food in their mouth and swallows it

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Hypo-Sensitivity to Touch

What does this look like?

Children that have hypo-sensitivity to touch/textures are often unaware of food items in their mouth. This might result in pocketing, overstuffing, drooling, or spilling/seepage of food from the mouth. Lack of sensation to food textures in the mouth can increase the risk of choking as they are unaware that they are overstuffing or pocketing food

(Autism Speaks, 2020).

Strategies to Help:

Portion control

- Cut food items into smaller bites
- Serve only one bite at a time
- Assist them in pacing their bites when using utensils

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More Strategies to Help:

Fun Techniques for Portion Control

Their mouth is the "foodie monster" and they can't have another bite until foodie monster is empty

Have child eat in front of a mirror and say "AH" after every bite so they can see that their mouth is empty before the next bite

Hyper-Sensitivity to Smell

What does this look like?

Children that have hyper-sensitivity to smell often experience aversions to a variety of scents from food and non-food items. This means that the child might be aversive to strong scented food items and therefore be unwilling to try tasting them (Autism Speaks, 2020). Children that are sensitive to smell can experience aversions to certain food smells and can even increase their sensation of taste, producing an even greater aversion to that food item (Davis et al., 2014).

Strategies to help:

Increasing their exposure to different scents in a playful and judgment-free zone can help increase their tolerance to various smells in a safe environment.

Incorporating a variety of scents into their play routine:

Scented hand soap, body wash, shampoo, lotions, etc.

Scented markers, crayons, stickers, or paints

Scented sprays or essential oils on highly used fabrics, toys, blankets, pillows, etc.

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More Strategies to Help:

Involve child in meal preparation tasks:

Allow them to smell each ingredient

Caregiver can model positive response to smells

Allow them to taste items when curiosity arises

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Hypo-Sensitivity to Smell

What does this look like?

Children that have a hypo-sensitivity or distorted sense of smell are often unable to detect the various scents of food and non-food items. Children with limited smell sensation might also experience a decrease in their sensation of taste which can impact their enjoyment of food (Autism Speaks, 2020).

Strategies to help:

Incorporating a variety of scents into their play routine

Practice labeling smells in their environment:

Practice labeling the things they smell in the home, at the grocery store, in the car, at the park, etc.

Caregiver models appropriate responses to smells in the environment in order to help the child identify and label scents

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More Strategies to Help:

Involve child in meal preparation tasks:

Have the child close their eyes before serving a snack. Allow them to smell and try to guess what is being served before eating.

Hyper-Sensitivity to Taste

What does this look like?

Children that have hyper-sensitivity to taste experience an increase in the flavor of food items. Children with taste over-sensitivity might refuse to eat certain foods that have strong flavors due to an extreme sensitivity to spicy, tart, salty, or sweet foods
(Autism Speaks, 2020).

Strategies to help:

Allow the child to participate in grocery shopping and meal preparation tasks without added pressure to try specific food items

Gradually introduce new flavors to their preferred food items

- start with foods that the child is comfortable with
- add new spices to familiar foods in small increments at the child's pace

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Hypo-Sensitivity to Taste

What does this look like?

Children that have hypo-sensitivity to taste experience a diminished flavor of food items. Children may seek out strongly flavored foods such as tart, spicy, or sweet snacks and meal items

(Autism Speaks, 2020).

Strategies to help:

Introduce meats, vegetables, and snacks with strong flavors and spices

- curried meals with lots of spices
- spicy sauces
- chilli flakes
- sweet sauces

Add flavor enhancers to meals to bring out the flavors of food items to provide the child with increased taste sensation

- allow the child to choose their own seasonings and flavor enhancers to add to their meals

Increase the temperature of food items to bring out the flavors and increase their sensation of taste

Allow the child to practice labeling flavors that they taste in the foods that they're eating to increase their awareness of flavors

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Hyper-Sensitivity to Sight

What does this look like?

Children that have hyper-sensitivity to sight experience sensitivities to light and certain colors. Children may avoid brightly lit environments or items/foods with a lot of bright colors (Autism Speaks, 2020). They might also display rigidity in their color preferences and refuse items and snacks that are different colors.

Strategies to Help:

Food chaining for color rigidity:

French Fries → Yellow Veggie Straw → Orange Veggie Straw → Thinly sliced Carrot Slices → Baby Carrots

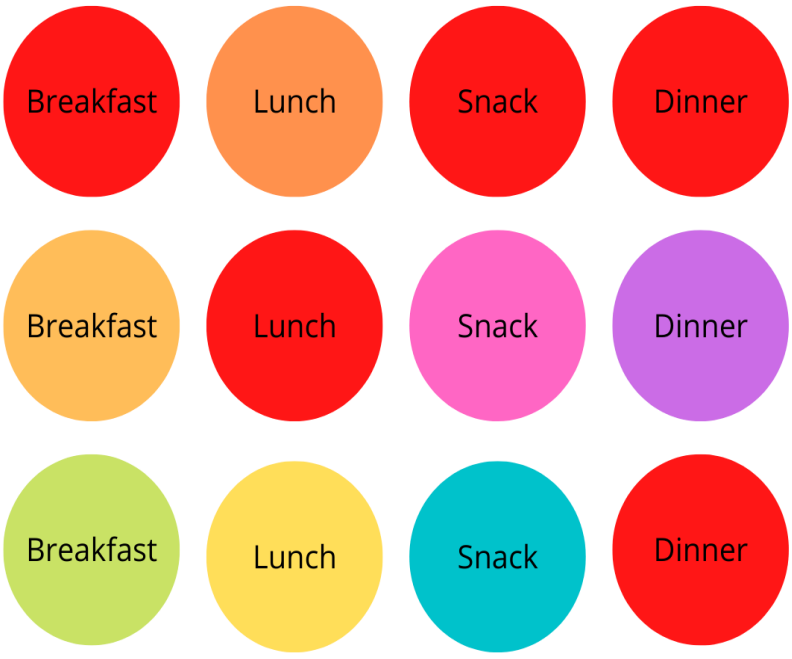
Cheese Puff → Cheetos → Orange Veggie Straw → Green Veggie Straw → Green Snap Pea Snack

More Strategies to Help:

Help your child become less rigid with color preferences during mealtimes

Use matching colored plates, bowls, cups, and utensils in multiple colors

Start with the child's preferred color and gradually mix in new colored items across different meals



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Hypo-Sensitivity to Sight

What does this look like?

Children that have hypo-sensitivity to sight experience difficulty recognizing things in their environment. This might cause them to seek out brightly colored items or brightly lit environments in order for them to see items in their environment more clearly

(Autism Speaks, 2020).

Strategies to help:

Use visually appealing or "fun" plates to increase curiosity and attention during mealtime

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Hyper-Sensitivity to Sound

What does this look like?

Children that have hyper-sensitivity to sound experience overwhelming feelings when they are surrounded by loud or unexpected noises and crowded places (Autism Speaks, 2020). Due to their sensitivities to sound, they might also experience discomfort when chewing crunchy or higher-textured food items because of the sound they make in their mouth.

Strategies to help:

Eliminate other sounds and distractions in their environment during mealtimes

Food chaining to desensitize the child to increase their tolerance to the sounds of higher textured food items

Apple Sauce → Apple sauce with small, chopped bits of apple → Warm caramelized apple slices → Thinly sliced apples

Orange dissolvable cereal → Orange veggie straw → Shredded carrot slices → Baby carrots

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Hypo-Sensitivity to Sound

What does this look like?

Children that have hypo-sensitivity to sound experience a decreased sensitivity to sound and might not be impacted by loud noises or crowded places (Autism Speaks, 2020). These children might seek loud spaces, make repetitive noises, or seek noisy items during play.

Strategies to help:

Play calming music or loud white noise during mealtimes to provide the sound input the child needs and help increase their attention while eating

Fidget clicker if the child makes repetitive loud noises during mealtime

Provide high-textured food items and snacks to provide the sound input for the child and make mealtimes more exciting and engaging

Apples

Raw Broccoli

Raw Carrots

Celery

Pretzels

Popcorn

Pita Chips

Crackers

What is the Proprioceptive System?

The proprioceptive system is responsible for allowing us to have awareness of where our muscles and joints are at, as well as the movements that our body is producing.

What does proprioceptive dysfunction look like in a child?

A child with proprioceptive dysfunction may present as uncoordinated, off-balance, clumsy, plays rough, pushes, prefers tight clothing, or may write too hard.

How does this relate to feeding experience?

Children that demonstrate poor proprioceptive feedback may have difficulty with eating because of their lack of awareness in the muscles and joints involved. This lack of awareness can lead to poor coordination when chewing and manipulating food in the mouth.

What is the Vestibular System?

The vestibular system is responsible for allowing us to sense our movements while maintaining balance.

What does vestibular dysfunction look like in a child?

A child with vestibular dysfunction may become dizzy easily, fall often due to poor balance, and have difficulty with motor activities such as hopping, skipping, and walking.

How does this relate to feeding experience?

A child with a poor vestibular system may be delayed or have difficulty with sitting upright. This can make mealtime challenging as the child may need to have support when seated.
(Ghai, 2019)

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Appendix B

NJA Therapy Services Agreement

THERAPY SERVICES, INC.
Redefining Child's Independence
310 N Indian Hill Blvd 413, Claremont, CA 91711
P: 909.833.1099 F: 888.856.3880
www.njatherapy.com

This agreement is established between Stanbridge University's Master of Science Occupational Therapy graduate students, Paige Boggess, Marli Boswell, Beah Grace Flores, and Mandeep Kaur and NJA Therapy Services, Inc to guide in the development, and creation of an evidence based occupational therapy feeding handouts for NJA Therapy Services, Inc clients and families. The aim of this graduate program project is to bridge the gap between intervention specialists and caregivers in helping young children to school age children with their feeding issues and difficulties.

This project will begin in June 2022 and terminate on November 2022.

Agreement Expectations

1. NJA Therapy will guide in the development and creation of the evidence-based feeding handouts, provide feedback as necessary, and review content for appropriateness of the information to be disseminated to clients, families in the future.
2. MSOT students will research evidence-based interventions, strategies, activities appropriate for young children to school aged children who are experiencing feeding difficulties, food aversion, picky eating behaviors, and specific populations such as autism spectrum disorder, and sensory processing issues.
3. MSOT students will not reproduce materials or include information without the consent of the primary author of the specific intervention.
4. MSOT students are expected to conduct themselves with professionalism, proper decorum, and respect.

Stanbridge MSOT Students	**NJA Therapy Services, Inc**
Paige Boggess	Naomi Achondo, OTD. OTR/L, SWC
Marli Boswell	
Beah Grace Flores	
Mandeep Kaur	

Appendix C

Institutional Review Board Approval

08.09.2022
Re: Research application R&G-2022-MSOT11-01

Dear Dr. Achondo and Research Team,

The Stanbridge University Research and Grants Committee has completed its review of your proposed study: "Occupational Therapy Home Feeding Handouts for Families to Improve Mealtime Experiences in Young Children."

The committee has approved your project and confirms that review by the Institutional Review Board is unnecessary. Should you wish to make any modifications to your project design, please contact the Research and Grants Committee to confirm whether those changes will require IRB oversight.

Sincerely,

Frederick Poling, MLIS, MA
University Librarian
Chair, Research and Grants Committee