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The SensoryFun! Toolkit: A Bilingual Resource for Parents & Caregivers

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Creating the SensoryFun! Toolkit©: A Bilingual Resource for Parents & Caregivers

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A culminating capstone project submitted to the faculty of Dominican University of California in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy

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Abstract

A sensory diet is an occupational therapy (OT) intervention strategy. A sensory diet is specifically designed to meet a child's sensory integration needs. Sensory diets are not standardized among practitioners and there are a limited number of resources available for individuals that do not have a clinical background like an OT practitioner. The lack of easy to understand resources for parents and caregivers creates several barriers for occupational therapists working with families with children experiencing sensory processing difficulties. One barrier is that there are few resources available in Spanish. The purpose of this project was to develop a resource for parents and caregivers using educational and easily accessible videos on sensory play activities for children. This compilation of videos was called the “SensoryFun! Toolkit©” a bilingual resource for parents and caregivers. To evaluate the wants and needs of parents for the toolkit, a parent focus group was conducted at Marin Head Start school. The results of the survey completed by parents were analyzed and used to develop various topics for the toolkit videos. To determine if the toolkit was understandable, accessible, and easy to use, parents were recruited to complete an online questionnaire and a pediatric occupational therapist was contacted to do an expert review of the toolkit. The parent feedback and expert review indicated that the toolkit was appropriate for families and provides accurate information in easier to understand terms. Using the toolkit, parents and caregivers can gain a better understanding of sensory integration, of a child’s sensory needs, and sensory activities or strategies that can be used to meet a child’s sensory needs. Occupational therapy practitioners can use this toolkit to overcome the barriers of family education on sensory integration therapy.

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Table of Contents

| | |
|------------------------------|-----|
| Abstract..... | iii |
| Acknowledgements..... | iv |
| List of Tables | vi |
| Introduction..... | 1 |
| Background..... | 2 |
| Statement of Purpose | 17 |
| Theoretical Framework..... | 18 |
| Ethical Considerations | 20 |
| Project Proposal | 21 |
| Discussion..... | 27 |
| Summary & Conclusions | 32 |
| References..... | 33 |
| Appendix A..... | 37 |
| Appendix B | 39 |
| Appendix C | 42 |

List of Tables

| | |
|---------------|----|
| Table 1 | 24 |
| Table 2 | 26 |

Introduction

Google generates about 6,220,000 results when you use search the term “sensory diets,” and generates about 286,000 search results for “sensory diet education for parents.” Many of these internet resources a parent would find provide lists of sensory activities, which is not a true sensory diet. Wilbarger and Wilbarger define a sensory diet as a “carefully planned program of specific sensory-motor activities scheduled according to each individual’s needs,” (in press). Any literature found through online searches explain sensory diets using very clinical language, and lack information about creating home programs. The main purpose of this project was to create resource for parents and caregivers that could accurately explain sensory integration and the use of sensory-rich activities in simpler terms. The second purpose of the project was to create a resource that is available in Spanish. In order to increase parent and caregiver education, our aim was to create an easily accessible and understandable sensory toolkit for use at home and within the community.

Background

The theoretical framework of sensory integration, based on Dr. Jean Ayres' work, primarily focuses on understanding the role of the vestibular, proprioceptive, and tactile systems to support function. Ayres' initial work was done to further understand the underlying cause of sensorimotor and learning problems to provide exemplary care for respective individuals (Bundy, Lane, & Murray, 2002). Sensory integration is our ability to process and interpret varying forms of sensory inputs that provide body schema and awareness of the environment. Children with difficulties have challenges participating in daily occupations and may need more verbal and physical support for task completion and behavioral regulation. A sensory diet is an individualized activity program based on Ayres' theoretical framework that provides sensory stimuli to meet a child's needs. Aside from providing sensory input to promote occupational engagement, most sensory diets also focus on making environmental modifications (Jorge, de Witt, & Franzsen, 2013). A sensory diet is intended to treat sensory processing problems by utilizing activities that stimulate the senses and make environmental adaptations to promote engagement in occupations (Bundy, Lane, & Murray, 2002).

Sensory Systems

The newborn brain has an abundance of non-specific connections between neurons. As the infant grows and interacts with the environment the neurons become stimulated and develop stronger and more organized connections. New sensations are processed and organized within the nervous system. Each connection builds on the infant's sensory perceptions and motor abilities. Sensorimotor development occurs primarily in early childhood. The sensory systems work together to help the growing child successfully navigate and participate in occupations.

Sensory diets incorporate input from all sensory systems. Although there are multiple integral sensory systems, Ayres' theoretical framework places emphasis on the vestibular, proprioceptive, and tactile systems in treatment. The vestibular system is a reference for all other sensory systems. According to Ayres, this system forms the basic relationship between the person, gravity, and the physical world. Vestibular receptors respond to the force of gravity and movement. Input from these receptors helps with posture, balance, and movement (Ayres, 2005). Proprioception is the sensory information caused by movement of the body, which involves the muscles and joints. This sensory system allows individuals to button clothes, open jars, jump, and walk upstairs (Ayres, 2005). Tactile receptors in the skin make up the largest sensory system in the body. Sensations of pain, touch, pressure, texture, and temperature influence physical and mental behavior. Most impulses are sent to the lower brain to enable efficient movement, adjust arousal, influence emotions, and place meaning on other sensory input (Ayres, 2005).

The early development of vestibular, proprioceptive, and tactile systems provides a foundation for later maturing visual and auditory sensory systems (Su & Parham, 2014). Visual receptors are stimulated by light, which facilitates environmental awareness and object identification (Ayres, 2005). Auditory sound waves trigger receptors in the inner ear to send impulses to the brain stem. These impulses are integrated with other sensory systems to make meaning of sounds, which can be refined to syllables and words (Ayres, 2005).

The gustatory and olfactory systems are both less prominent in sensory integration theory. The gustatory system allows people to taste sweet, salty, sour, and bitter. This influences an individual's preference for foods and helps individuals avoid things that could be

harmful (Ayres, 2005). The olfactory system informs people about the odors in the air. Smell regulates emotions and creates memories that influence personal preferences (Ayres, 2005).

Through development, children learn how to receive and process sensory information. They also learn how to respond to more than one sensation at a time. Most activities require individuals to combine input from the different sensory systems. When the sensory systems cannot integrate efficiently, function is impaired, and individuals have difficulty participating in daily activities. This is seen in sensory processing disorders.

Sensory Dysfunction

Sensory Processing Disorders

Sensory processing disorder (SPD), also known as sensory integrative dysfunction, is defined as “the brain not processing or organizing the flow of sensory impulses in a manner that gives the individual good, precise information about himself or his world,” (Ayres, 2005, p. 47). This means the brain cannot process the information it receives from the senses properly, which in turn leads to not directing the behavioral response properly either.

The four main types of sensory processing disorders are sensory modulation disorder, vestibular-based postural disorder, sensory discrimination disorder, and dyspraxia. Sensory modulation disorders are defined as unusual under or over-responsiveness to sensation (Ayres, 2005). The most common type of sensory modulation disorder is sensory defensiveness and is one of the aspects of SPD that frustrates parents and teachers the most. Sensory defensiveness is presented as negative or emotional reactions to sensations. Often children with sensory defensiveness are more easily upset. In order for our bodies to sense stimuli, we have sensory thresholds. These neurological thresholds indicate the number of stimuli needed for the nervous system to create a response (Dunn, 1997). Children with high neurological thresholds react less

or take longer to react. On the other hand, children with low thresholds have more frequent reactions to stimuli in the environment (Dunn, 1997). This means that for the same stimuli, for example a car horn, a child with a high neurological threshold will have much less of a reaction than a child with a low neurological threshold. The child with the high threshold may not react at all and the child with the low threshold may jump or become upset. Vestibular-based postural disorder is the disorganization of the vestibular system. When it is disorganized, it affects all aspects of a child's life, including school, play, and activities of daily living, as the vestibular system is strongly interconnected with all other parts of the brain. Sensory discrimination disorder is the incorrect processing of sensory information. This means that children cannot distinguish between two similar sensory inputs. For example, a child may not be able to feel the difference between a coin and a button in their hand. Dyspraxia is one of the most common forms of SPD in children with learning disorders and mild cognitive delays. Dyspraxia interferes with the ability to motor plan, which can result in movements similar to a motor disorder, such as hands and feet moving in the wrong direction when running to catch a ball.

Comorbidities

Many individuals with neurodevelopmental or learning disorders also have SI problems. A common comorbidity is autism spectrum disorder, or ASD. Baranek (2006) found that the prevalence of sensory symptoms for children with autism is 69% and that these symptoms are inversely related to cognitive age. This means that children who have a younger cognitive age are more likely to have more sensory symptoms. Cheung and Siu state the following:
Review of the clinical and autobiographical literature suggests that sensory processing

dysfunction in autism is global in nature and affects all the main modalities across multisensory processing systems. Estimates of sensory-perceptual abnormalities in children with autism have ranged between 42% and 88%. (2009)

This means that well over half of children that have ASD have some form of sensory processing abnormality. This is an extremely high number of the population and studies show that auditory processing is the most commonly reported impairment among sensory processing disorders.

SPD is also commonly seen in attention-deficit/hyperactivity disorder, or ADHD.

Children with ADHD often have lowered thresholds for responding to stimuli in the environment which leads to more activity and less adaptability (Cheung & Siu, 2009). Cheung and Siu (2009) explain that children with ADHD may not properly receive or register sensory stimuli, and this may affect their engagement within the community. This goes to show that SPD affects children with ADHD in all aspects of their life and may add to their hyperactivity, especially in over stimulating situations.

Child Behaviors

SPD can be categorized into two different subdivisions; a child can be under or over responsive. Within these two categories, children display different behaviors which can include difficulties in areas of self-regulation, emotional regulation, attention, muscle coordination, and in learning. Under-responsiveness is described as difficulty with sensory modulation when the child has a higher than expected threshold for responding to stimuli, meaning he or she requires more stimulus to trigger a response. Over-responsiveness is the opposite, where the threshold for responding to stimuli is lower than expected, and a child reacts negatively or with an increased reaction. (Critz, Blake, & Nogueira, 2015). For some children, this under-responsiveness may cause them to appear quiet or in their own world. Sensory defensiveness is a form of over-

responsiveness, which may appear as the child rejecting new tastes and textures, and rejecting being held or cuddled. These behaviors can often lead to delays in developmental milestones.

Sensory modulation is also difficult for a child with SPD. Sensory modulation is defined as “an inability to regulate responses to everyday sensory stimulation to which most people easily adapt” (James et. al, 2011). Self-regulation, on the other hand, is an individual’s ability to regulate his or her own behavior (Eisenberg & Sulik, 2012). Infants rely on parents for self-regulation, but as they grow older, they develop strategies and sensorimotor activity to self-regulate, often beginning with thumb sucking. When a child cannot cope easily to changes in routine or emotional and behavioral disruptions, the child demonstrates symptoms of regulation, also known as sensory processing disorder, or RSPD (Jorge, de Witt, and Franzsen, 2013).

Another behavioral difficulty that may arise for children with SPD is emotional regulation. A child with emotional regulation difficulties, “...is likely to react differently to circumstances. This child may also be overly sensitive, and his feelings are often hurt. He is likely to have trouble coping with everyday stress or new and unfamiliar situations” (Ayres, 2005, p. 52). Children that struggle to regulate their emotions are often the victims of bullying, as children are often cruel to each other. To cope with this, these children play with younger children that cannot challenge them, older children who understand, or may choose not to play with other children at all. This can affect a child’s development and their social interactions.

Maintaining attention may be a fourth major behavioral difficulty for children with SPD. This can be a major problem in school, especially since many classrooms are sensory overloaded. When children cannot shut out noises, lights, and the surrounding room activity, they may not be able to learn at their full potential (Ayres, 2005, p. 51). A lack of attention is

often one of the first things parents notice and complain most about, stating that their children often have difficulties sitting still and lack purposeful activity.

A fifth area of behavior that children with SPD may have difficulties with is muscle movements and coordination, as seen in vestibular-based postural disorders and dyspraxia. Children with SPD or other comorbidities often have low muscle tone which makes them appear weak and easily fatigued. Because of this, children are often seen leaning on walls when standing, leaning on their desk, and resting their head on their arms. Often, these postures can be interpreted as uninterested, bored, lazy, or not paying attention. In relation to movement, children often drop things more often, lose their balance and fall, or sometimes fall out of chairs because they cannot feel where they are on the chair (Ayres, 2005, p. 52).

A final common behavioral difficulty may be learning challenges. Activities such as reading, and writing require high amounts of sensory integration and make complex demands on the brain. With SPD, the brain is unorganized and cannot find the correct memories to correctly form letters to write. Some children may be unable to understand verbal instructions or control finger movements, inhibiting their ability to write down what they hear (Ayres, 2005). When learning in the classroom becomes too difficult, children often skip classes, while others may drop out.

Implications for Occupational Performance

Children may experience occupational and performance challenges in certain settings due to SPD. Children with SPD may demonstrate atypical behaviors at school, home, and in the community. According to Critz, Blake, and Nogueira (2015), identification of sensory processing challenges in children is important because these challenges can affect behavior, learning, and the way children negotiate the world. When left unrecognized and untreated,

children with SPD are mismanaged and misunderstood by parents and teachers. Critz, Blake, and Nogueira provide information to help health practitioners and families identify sensory processing challenges in children and understand treatment.

School, Home, & Community

School-age children with SPD have trouble paying attention, interacting with friends, learning, and demonstrating proper classroom behaviors. Examples of these atypical behaviors include: the inability to complete school work or tests, difficulty learning new skills and information, covering ears when school bell rings, trouble transitioning from one classroom activity to another, difficulty adjusting to change, or difficulty calming down for seated activities (Critz et al., 2015). Behaviors such as the ones listed, hinder a child's performance in the classroom. By identifying a child's sensory processing challenges, Critz et al. believe that sensory strategies and classroom accommodations can be identified, and treatment can then focus on modifying the school task demands (2015).

At home, children with SPD also experience difficulties with daily functions. Depending on a child's symptoms and type of sensory processing dysfunction, typical home situations may be upsetting or overwhelming to the child. For example, a child may overreact to touch such as rejecting hugs, having tantrums, crying, and showing aggressive behaviors (Critz et al., 2015). Children with these behaviors may present challenges for parents. Practitioners working with these parents have an important role. Critz et al. (2015) and Zimmer and Dirsch (2012) believe that it is a health practitioner's responsibility to educate families on how to best promote regulatory functioning and how to understand the effect of SI treatment at home. Zimmer & Dirsch (2012) described a healthcare professional's responsibility as "teach[ing] families how to evaluate the effectiveness of SI therapy" (Zimmer & Dirsch, 2012, p. 1188). Educating families

on how to evaluate the effectiveness of therapy can help parents promote the improvement of their child's ability to engage and participate in everyday activities.

Many of these atypical behaviors within the home and school can transfer to other places in the child's community. These examples are behaviors which may not comply with social expectations and, overall, the child's atypical behaviors can negatively affect the child's participation within the community. A child with SPD may experience difficulties such as: increased anxiety with new situations, people, or demands, over responsiveness to sights, sounds, smell, touch, and movement, feeling overwhelmed by bright lights, busy environments, close-range eye contact, and "out-of-proportion reactions" (Critz et al., 2015). Going to places such as the mall or grocery store can be difficult for a child with SPD.

Clinical Application

To help ease the negative impact of SPD on a child's occupational performance, occupational therapy (OT) practitioners use sensory interventions. Case-Smith, Fristad, and Weaver (2015) state that sensory interventions "have been inconsistently defined and refer to widely varied practices." Out of 1,540 studies, Case-Smith et al. (2015) only found 19 studies that met the criteria of a true sensory intervention. Based on Case-Smith et al.'s (2015) systematic review, OT practitioners do not have a standardized approach to use when treating SPD. As a result, practitioners use disparate procedures that cannot be compared among other practitioners. Case-Smith et al. believed that these interventions arise from different conceptualizations about sensory integration and sensory processing as neurological and physiological functions that influence behavior (2015). In order to educate practitioners of the different types of sensory interventions, Case-Smith et al. highlight the importance of

distinguishing between sensory integration therapy (SIT) and sensory-based intervention (SBI) and understanding the criteria of a true sensory intervention.

Sensory-based intervention (SBI) vs. Sensory integration therapy (SIT)

SBI is an “adult-directed sensory modality that [is] applied to the child to improve behaviors associated with modulation disorders” (Case-Smith et al., 2015). One of the goals of SBI is to promote behavioral regulation by activating the somatosensory and vestibular systems. SBI is made to fit into the child’s daily routine, in their natural environment, or in a clinic setting. SBI is not the same as SIT. Unlike SIT, SBI may use single-sensory strategies, for example, weighted blankets, pressure vests, brushing, and sitting on a ball. SBI is based on specific types of sensory input hypothesized to have an effect on self-regulation (Case-Smith et al., 2015), and not manualized or systematically developed techniques like SIT.

SIT, on the other hand, is “a clinic-based intervention that uses play activities and sensory-enhanced interactions to elicit the child’s adaptive responses” (Case-Smith et al., 2015). The primary goal of SIT is to increase a child’s ability to integrate sensory information so the child can effectively respond to social and physical environment. This can be done in a clinical setting with the use of equipment such as, swings, therapy balls, inner tubes, trampolines, and climbing walls. OT practitioners that use SIT modify a child’s routine and environment to support self-regulation. SIT is child-directed, rather than adult-directed, and works to promote child engagement through environmental changes and by providing activities that satisfy a child’s sensory needs by improving their sensory processing skills. SIT is based on Ayres work and the manualization done by Parham et al. (2011). Parham et al. (2011) are primary contributors to creating a standard for sensory integration treatments and interventions. By

manualizing SI therapy, Parham et al.'s work helps to decrease inconsistencies and confusion within OT practice.

Standardization of Sensory Intervention

Parham et al. reviewed studies claiming to have used sensory integration, however, the descriptions of the intervention across the studies were quite different from each other with no consistent standard for ASI (2011). In order to reduce disparities among sensory intervention treatment Parham et al. developed the Ayres Sensory Integration Fidelity Measure. The Ayres Sensory Integration Fidelity Measure “provides a tool for ensuring that intervention called sensory integration is replicable and consistently adheres to the principles of Ayres’ sensory integration frame of reference” (Parham et al., 2011). The systems have five parts containing “ten essential elements” essential for sensory integration treatment. The ten elements are that treatment ensures physical safety, presents sensory opportunities, helps the child to attain and maintain appropriate levels of alertness, challenges postural, ocular, oral, or bilateral motor control, challenges praxis and organization of behavior, collaborates in activity choice, tailors activity to present just-right challenge, ensures that activities are successful, supports child’s intrinsic motivation to play, and establishes a therapeutic alliance (Parham et al., 2011).

Case-Smith et al. and Parham et al. perceived the need to define, distinguish, and standardize the approach to sensory processing dysfunction because of confusion among practitioners and researchers. If practitioners lack an understanding of the differences between SI, SBI, and sensory strategies, they are unable to clearly explain these differences to parents. While this fidelity model helps define Ayres SIT, clarity still does not exist for other concepts like SBI, sensory strategies, or sensory diets.

Sensory Diet Components

Sensory diets first originated as follow up interventions for newborns and premature infants discharged from the NICU (Wilbarger, 1984). Then with Avanti Camps, sensory diets were implemented with older children (Wilbarger, 1995). Wilbarger and Wilbarger (In press) defined sensory diets as a carefully planned program of specifically sensory-motor activities scheduled based on each individual's needs and routine. A sensory diet is tailored to the individual child, because each child's sensory needs and sensory processing challenges are different. In addition to carefully planned sensory-motor activities, a sensory diet has four other components: modify routines, adjust interactions, adapt tasks, and structure environments (Wilbarger & Wilbarger, in press). The routine component means that a sensory diet focuses on the child's, as well as the rest of the family's routines. The interactions component describes the types of interactions the child may encounter. The tasks component of a sensory diet focuses on the sensory qualities or sensory demands of tasks. And the environment component analyzes the physical environment, such as having too much noise or distractions for the child. To create a standard sensory diet requires all these components. By educating parents on these components, OTs are working to reduce parents' confusion of sensory diets.

Parent & Caregiver Education

As an OT develops a sensory diet, it is vital to collaborate and work with the child's parents. After conducting a search of the literature, no empirical papers provided information on the type of training or sensory diet education parents may receive from an OT. Parents have online access to websites, books, and even a mobile application about sensory strategies, all of which help parents understand SPD and provide sensory strategies or activities to use at home or at school. However, there is a misconception of a sensory diet being merely a list of sensory activities, and there is limited information on how parents can create the ideal sensory diet at

home. OTs are educators and, as the family's practitioner, have the opportunity to help parents understand which resources are valid and reliable.

Parent Perceptions About Occupational Therapy Treatment

Parents often desire a “cure” for their child’s sensory processing problems, and they want to believe OT treatment is that cure. Though SPD may not be cured completely, a therapist can improve a child’s sensory processing substantially to enable them to function more effectively in their occupations. According to Cohn (2001), parents seek OT treatment for their children due to the child’s problems with social participation, not because of deficits in the child’s abilities. A common goal among the parents is for their child to socially participate in the community. Cohn (2001) notes one parent commented that “knowledge of her daughter’s sensory processing enabled her to be more supportive of her daughter” (2001, p. 290). Family education has the ability to empower parents and encourage them to advocate for their child and request reasonable accommodations when appropriate. Cohn shows the impact and importance of educating parents on sensory processing dysfunction, but there are limited resources for education on sensory diets. Cohn found that parents who are provided with education and strategies, value this information and feel validated and supported as parents with children with SPD. Parents should have easy access to resources, such as a sensory toolkit, to support their child and validate their parenting.

Parent & Caregiver Resources for Sensory Diet

Often, the first step a parent does to learn about their child’s sensory processing disorder is search the internet, but web resources do not go beyond the definition of sensory diet. Several websites from the “sensory diet” google search, such as sensorysmarts.com and asensorylife.com provide extensive lists of sensory diet activities, rather than a true sensory diet. While understood.org defines and provides an example of a sensory diet, the website focuses mainly on

the therapist's responsibility. Understood.org also has a sensory diet template, however the template lists sensory diet activities and with limited information for parents to understand the purpose of those activities. Blogs by parents and OTRs, such as "A Sensory Life!" (Voss, 2014), replicate these websites and provide a list of examples of sensory games and activities. By only listing sensory activities, these websites lack two important components of a sensory diet: routine and an individualized plan for the child.

Recommended books for parents, based on web searches include: *Sensational Kids: Hope and Help for Children with Sensory Processing Disorder*, *The Out-of-Sync Child: Recognizing and Coping with Sensory Processing Disorder*, and *Raising a Sensory Smart Child: The Definitive Handbook for Helping Your Child with Sensory Processing Issues*. All three books have content written by OTRs, teachers, and parents, all of which have personal experiences with a sensory diet. However, these recommended books are lengthy, cost money, and give little to no information on a sensory diet. To some parents, book resources may not be helpful and repeat the same information as the web resources. In fact, all three books provide suggestions for sensory strategies and activities, but only *The Out-of-Sync Child* discusses a sensory diet in a one-page overview.

Another resource is a mobile application called [SensoryTreat](#). This application was created for both parents and practitioners, and to facilitate collaboration. The application creators have two children with sensory issues and understand the importance of carrying over treatment from OT sessions into the home. The application allows parents to create a sensory diet home program. Similar to the Canadian Occupational Performance Measure (COPM), parents rate their child's current performance, performance satisfaction, and create a performance goal. From this, the parent can add their child's routine and select sensory activities

to add into this routine. Parents also receive reminders of when to do the sensory activities and maintain a regimen. The application provides graphics, pictures, and the ability to add sensory activities. Therapists who subscribe to the application have access to a family's home program and can monitor progress. The application is customizable, allowing parents and practitioners to have their own individualized program rather than a generic template. This mobile application is more visual and individualized compared to the resources provided on websites and books.

After reviewing the possible resources for parents and caregivers, this brings up questions like, "What are effective ways of providing information to parents?" and "What are parents looking for in sensory diet training and education?" Further research is needed in order to determine the preferred resources parents want for sensory diet and home program education. To go beyond the list of sensory diet activities or games, a toolkit can be created to educate parents in sensory diet as well as increase a parent's understanding in creating and implementing a sensory diet at home.

In conclusion, sensory integration is a well-researched topic with an abundance of information for occupational therapists to utilize. The problem then comes with translating that information to families in a way they can understand and implement a sensory diet outside of therapy sessions or for families without ongoing OT support. Our goal was to create a toolkit, based on information we gathered from families and practicing therapists to provide an ideal resource for parents and caregivers to use in combination with treatment sessions from therapists.

Statement of Purpose

Parent education on sensory integration therapy is limited. OT practitioners use sensory diets and other sensory-based interventions or strategies. While based on sensory integration theory, most treatment plans and sensory diets do not follow a set standard. This results in a variety of therapies that do not use the original sensory integration protocols as described by Ayres and creates treatment disparities. The sensory diet inconsistencies and confusion among OT practitioners mean that parents will be just as confused, possibly even more so. Our project objectives included the following: parents will understand the meaning of a true sensory diet to increase awareness and emphasize the role they have in their child's sensory perception, will develop a better understanding of their child's sensory needs, and apply sensory techniques demonstrated in the project videos while playing with their child (at home or in the community). We met these objectives through a sensory toolkit that includes numerous videos explaining the various concepts of sensory integration, sensory diets, and how to implement sensory-rich activities easily at home.

Theoretical Framework

The core of this project is based on Ayres' sensory integration theory. Like all theories, the sensory integration theory assumes various principles. One of the main assumptions is that the central nervous system can reorganize synaptic connections in the brain. This phenomenon is commonly known as neuroplasticity. According to Ayres, children between the ages of three and seven were known to be at the peak of developing sensory integration and assumed that older children could no longer benefit from therapeutic interventions based on the sensory integration theory (Bundy, 2002, p. 10). However, current studies have found that is not true. In fact, the brain's ability to modify neurological patterns occurs throughout life thus, sensory integration-based interventions can be used on various age groups.

The second assumption is that sensory integration develops over time. The sensory integration theory assumes that at the time of birth, the brain is "immature" and remains as is even as the child develops. The goal of sensory integration is then to "provide stimulation that will address certain brain levels (primarily subcortical), enabling them to mature [or function more normally], and thereby assisting the brain to work as an integrated whole" (Bundy, 2002, p. 11).

Ayre's third assumption is that the brain functions as an integrated whole. She believed that the lower centers of the brain were responsible for sensory integration and these areas needed to be developed before higher-level centers. This hierarchy emphasized a linear thinking of the brain's development, which is not true. With the recent understanding of the complexities of the brain, this notion had been modified to consider the various areas of the brain as an open system and when they interact with one another, it contributes to optimal sensory integration.

The sensory integration theory also assumes that adaptive interactions are critical to sensory integration. Our interactions with our environment promote learning, which forms the foundation for more complex experiences. New nerve connections promote learning and may result in changed behavior, which facilitates sensory integration.

The fifth assumption is that individuals have an inner drive to develop sensory integration through participation in sensorimotor activities. Ayres noted that children with sensory integration dysfunction did not demonstrate an inner drive to participate in new experiences or encounter new challenges. She believed a therapist could observe the effectiveness of an intervention when a child first demonstrated an interest in participating in an activity. This leads to the extreme importance of child-directed therapy, which means that the child is leading the play in ways that he or she finds interesting while the therapist implements a sensory diet. As sensory diets are based on the individual, the therapist works to create a diet that is tailored to the specific sensory needs of the child.

Ethical Considerations

This project did not provide participants with treatment. We did not create risks or do harm to our participants, instead, we provided participants with educational videos and resources (nonmaleficence). Our intention was to create a toolkit that has the potential to elicit a positive response for both parents and their children (beneficence). Our obligation was to utilize communication with the parents, agency coordinators, and educators as a resource that facilitated the creation of our toolkit (fidelity). We presented the information accurately in all forms of communication including videos, a website, and personal meetings (veracity). Parents were given access to project resources but were not be forced to comply or use the sensory toolkit. Parents were also free to use the toolkit, or not, at any time (autonomy). Project resources were available free of charge so that each participant had an equal chance of accessing the information (justice). This project adhered to the Occupational Therapy Code of Ethics of the American Occupational Therapy Association (2015).

Project Proposal

This project aimed to create a series of informative videos for parents to watch on topics related to the different senses, sensory-rich activity implementation, as well as the purpose and benefits of implementation. To determine the content of the videos a needs assessment was conducted with the parents at Marin Head Start. Following the needs assessment, we developed video ideas after analyzing the parents' responses to a written survey. After each video was created, the videos were posted to a YouTube channel. English videos were published on our English channel while Spanish videos were published on our Spanish channel. In order to evaluate the usefulness of the videos, we created an online survey for parents to complete after visiting the YouTube channels.

The rationale for our project design was based on the suggestions and information from Susanne Kreuzer, the Education Manager at Marin Head Start. Ms. Kreuzer reported that most parents at Marin Head Start had low literacy rates, and some only spoke Spanish. Ms. Kreuzer also informed us that the parents invested their money in smartphones. If parents had smartphones, they had access to online resources and websites. Using their phones, parents could access our videos while at a playground or at home.

Target Agency

The target agency for this project was Marin Head Start. Marin Head Start is a child and family development program that provides low-income families and their children with comprehensive health services, education services, and social services (Community Action Marin, 2012). Marin Head Start promotes parent involvement and gives parents the opportunity to establish a relationship with their children by holding "family fun" events. Within this population, "the incidence of sensory modulation disorders [in children] increases to 35% in a

Head Start sample, with 45% of those children showing extreme differences in under responsive or seeking behaviors” (Reynolds, Shepherd, & Lane, 2008 as cited in Smith Roley, Bissell, & Frolek Clark, 2015). As a result, some parents do not understand how to engage in sensorimotor activities that address their child’s sensory needs. Thus, for this project, we wanted to target parents from a class of three-year-olds enrolled in Marin Head Start. The project aimed to meet the needs of Marin Head Start parents and to be relevant to other parents at outside agencies.

Needs Assessment

To determine the content of our videos, a parent needs assessment was conducted. During this phase, parents completed a questionnaire. Our goal was to understand what activities the parents did with their child, understand the children’s sensory needs, identify challenges parents had when attempting to play with their child, and plan for relevant sensory activities for the family. The questionnaire included the following questions: *What do you do for fun with your child?, What play activities do you engage in during the weekday vs. the weekend?, What toys does your child typically play with?, How often do you and your child play together?, Do you experience challenges when trying to play with your child? If so, please explain, What challenges does your child experience throughout the day? What time of day does this happen?* The parent questionnaires were translated to Spanish because the preschool teacher informed us that majority of the parents spoke minimal English. These questions helped us determine the pattern of play between the parents and their child and provided us with information about challenges their children experienced throughout the day and challenges the parents experienced when trying to play with their children. The parents’ answers related to gross motor activities, difficulty finding time to play with their child, and the child’s level of arousal after school. Overall from this needs assessment and meeting with the parents of Marin Head start we learned

that the families were low income, Spanish speakers, parents had limited time in their day, parents were unsure how to manage their child's level of arousal after school, every family has smartphones, and the project videos would need to include explanations and examples of when the sensory activities could be implemented during a child's day.

Project Implementation

After the initial needs assessment, we began to create several videos for our toolkit. The process of creating a video included first developing a script. Once the script was created, edited, and translated to Spanish, we contacted child volunteers to participate in various sensory-rich play activities, and then filmed the child participating in the sensory play activity. To recruit child volunteers for the videos, we reached out to parents we personally knew via email and used an informational handout to explain our project and what the child would be doing if they were to be in one of our toolkit videos (Appendix B). Parents interested in participating in our project had to sign the Dominican University Occupational Therapy Department Consent form (Appendix A) for their child before filming. When editing together what had been filmed, the English and Spanish voice-overs would be added to the video. After completing any final edits, the videos were published on YouTube.

The YouTube channel has a video library of different examples and settings where sensorimotor play can be implemented. Parents have easy and free access to these YouTube videos. Some project videos explain sensory integration, provide parents with information about a child's different sensory needs, and explain which activities are best for their child to complete. Other videos focus on instructing parents on how to engage in sensorimotor play with their children, and how to utilize settings, such as playgrounds, to engage in sensorimotor play.

Table 1

List of Videos Posted to YouTube

| Video Title | Video Link |
|---|---|
| What is a Sensory Toolkit? | https://youtu.be/0fJGX5YOId0 |
| What is Sensory Integration? | https://youtu.be/4bFke6jzH40 |
| The Sensory System | https://youtu.be/-y1R2rFs0PQ |
| Sensory Play at Home: Oral Motor Games | https://youtu.be/HfjnD2BkJ6c |
| Sensory Play at Home: Proprioceptive Games | https://youtu.be/SWtmkj45so |
| Sensory Play at Home: Vestibular Games | https://youtu.be/9EIA14onc30 |
| Sensory Snack Time | https://youtu.be/DZ9v8msUoOw |
| Tactile Play: Sensory Bins | https://youtu.be/zxfN-duEu98 |
| Transitions: Car Rides and Trips to the Store | https://youtu.be/99QW9mheB5w |

The videos are categorized and separated into playlists according to sensory integration concepts. Each child has his or her own individual routine, so the videos provide activities that can be completed during general times of the day, such as activities to complete before school, after school, after dinner, and before bed. Parents' needs were taken into consideration to create videos that are relevant to families in the community.

In addition to teaching parents about different sensory responses and needs, our educational videos focus on informing the parents about the purpose and how to use our sensory toolkit. Each video ranges from 3-5 minutes. For the videos, we recruited children volunteers between the ages of 3 and 8. By using child volunteers to create real-life situations, we demonstrated parents the sensory techniques they could use when playing with their children.

For each child volunteer, we obtained consent from their parents using the Dominican University Occupational Therapy Department Consent form (Appendix A). We also created a website as an additional resource for parents that is accessible when provided with the corresponding link. The website contains information about our project, provides information about sensory integration, and directs parents to our YouTube channel for sensorimotor activities.

Project Evaluation

The project evaluation was intended to be based on the feedback and comments collected during the Marin Head Start parent focus group in August 2018. However, because Marin Head Start parents did not watch our videos as instructed, we were unable to gather information from our initial target agency. To gain information on the clarity, accessibility, content relevance and understanding of our videos, we reached out to other community agencies and families and asked that they look through our YouTube channel. After watching one or more videos, families were instructed to complete a SurveyMonkey [online questionnaire](#) (Appendix C) that included questions such as *“Were you able to understand the video content?”* and *“Did you try any of the activities or techniques demonstrated in the videos?”* Overall, we received positive feedback from four families about the content and accessibility of the YouTube channels and videos. Only two parents tried a sensory play activity with their child. The other two parents commented that they watched our videos, and did not implement the activities, but planned on doing so in the future.

Table 2

Results from Online Parent Questionnaire (Total number of parents to complete questionnaire,

N = 4)

| Question | Answer | |
|---|---|--|
| Were you able to navigate the YouTube Channel? | Yes: 4 out of 4 | No: 0 out of 4 |
| How many videos interested you or seemed relevant to you and your family? | Average Number Answer: 6 Videos* *Note: Only 6 videos were published at the time these parents completed the survey. | |
| How many videos did you watch? If one or more did you watch the entire video? | I watched more than 1 entire video: 4 out of 4 | |
| Did you watch the videos in English or Spanish? | English: 4 out of 4 | Spanish: 0 out of 4 |
| Were you able to understand the video content? | Yes: 4 out of 4 | No: 0 out of 4 |
| Did you try any activities or techniques demonstrated in the videos? | Yes: 2 out of 4 | No: 2 out of 4 |
| If you answered yes to the previous question, when did you use an activity or technique? Did the activity help your child? Did you and your child have fun? | Yes Answers: “Blowing the cotton balls on the table...yes, we had fun” “Oral sensory play! It was so fun for my boy and he loved it!” | No Answers: “I’m planning to try...all seem interesting” “Plan on trying these techniques” |
| Would you recommend these videos to other parents or families? | Yes: 4 out of 4 | No: 0 out of 4 |
| Any comments, feedback, or suggestions about the YouTube channel or videos? | “They are easy to understand.” “Great channel!” “No.” “Fun channel.” | |

Discussion

The overarching goal of our project was to increase parent and caregiver education by creating an easily accessible and understandable toolkit of sensory-rich activities and strategies. Using YouTube as a platform, access to information about sensory integration and sensory activities is easily available to parents, both in English and Spanish. The videos include activities that can be completed at home as well as in the community. Engaging in these sensorimotor activities, help children increase the efficiency of their sensory systems which lay the foundation for important skills that develop throughout the lifespan. Occupational therapists educate parents as part of their treatment plans to help the child develop the skills needed to participate in activities at home and school. By creating an ideal resource for parents to understand how they can meet their child's sensory needs, we provide families with support without direct OT intervention.

This video toolkit was designed to be a resource for practicing therapists to help bridge the gap in family and caregiver education and for families and caregivers trying to implement sensory activities outside of therapy. Based on a needs assessment, 9 videos were developed and uploaded to a YouTube Channel. The toolkit is available on YouTube with videos in both English and Spanish. The videos provide examples of the benefits of sensory play activities and demonstrations of sensory play with a child. Videos also include a voiceover providing additional information for parents and caregivers using non-OT language. Some of the videos from our toolkit include "What is a sensory toolkit?," "What is sensory integration?," "Tactile Play: Sensory Bins," and "Sensory Snack Time," among others.

We reached out to other families in the community, as well as a pediatric occupational therapist, to gain more feedback and a get a better understanding of the effectiveness of our

toolkit. Four families completed the survey, giving us positive feedback about the toolkit. Dr. Laura Greiss Hess, a pediatric occupational therapist, also reviewed and critiqued our SensoryFun! Toolkit© and affirmed that the toolkit was an accessible resource that bridged the gap between a “home-made” resource from parents and an overly professional resources from practitioners. Because the feedback we received did not ask for any changes to be made, no changes were made before finalizing the project. Based on these responses, we believe that we are closer to attaining our goal of educating families about sensory-play activities in an easily accessible way.

For our project, we identified a gap between what therapists knew and what families understood based on the information gathered when initially working with Spanish-speaking families from Marin Head Start. These families were unaware of how to engage in sensorimotor activities appropriate to their child’s sensory needs. Through observation and a needs assessment, it was determined that the families needed a resource for at home and in the community. The teacher was presenting sensory options in the classroom; however, none were available in the families’ homes. Considering the prevalence of sensory modulation disorders among this population, we wanted to create a bilingual resource that contained easy to understand information to allow the parents to facilitate a child’s engagement in sensory activities.

Throughout the process, we learned that working with a school and trying to have families commit to participate in a project can be extremely difficult, especially when there are no incentives for them. This project needed parents to commit to tasks that are outside of their regular responsibilities and as stated in the survey responses these parents have very limited time. Establishing a stronger therapeutic relationship with the Marin Head Start families and

faculty may have increased the families' desire to participate and use the toolkit but there is no way to confirm this. In the future, reaching out to more schools and maintaining consistent contact in order to receive more feedback would be helpful, as well as reaching out to more experts in the field, to learn what practicing therapists would like added to the toolkit.

Implications for Occupational Therapy Practice

The SensoryFun! Toolkit© is an accessible resource to help parents and caregivers understand how they can support their child's sensory needs outside therapy treatment sessions and allows them to play an active role in the development of their child's home program. One role of an OT practitioner is to be an educator and by using our toolkit, practitioners have a resource they can refer to parents to learn about sensory integration and sensory play. And because our resource is available in Spanish, practitioners are able to overcome language barriers when working with Spanish-speaking families. Our resource can make family education about sensory integration easier for OT practitioners because the toolkit avoids using clinical or OT language and provides real-life examples that would be relevant to a family.

Limitations

One limitation of this project is that we received limited feedback and none from the target parent group at Headstart. We lost contact with the Marin Head Start parents from our initial assessment and had to reach out to other families. In total, we received feedback from four families. If we had received more feedback from parents and caregivers, we would have a better understanding of the usefulness and success of the toolkit. However, the parents and caregiver feedback obtained provides assurance that our videos were helpful and could be implemented in a family schedule. More feedback would also provide us with information about what other topics parents and caregivers want to see in our video toolkit. Another limitation is

that while we were able to create ten videos for our toolkit, the content available does not cover all the topics of sensory integration and does not address all the challenges a child with sensory processing issues may experience. The content of our videos covers a variety of aspects, but there are more topics that could be covered. The content would also be helpful in more languages. While English and Spanish are the primary languages spoken for the families we interviewed, other families could benefit from languages such as French, Vietnamese, Chinese, or Tagalog.

Future direction

This toolkit does not replace a sensory diet but acts as a supplemental resource that can be used outside of therapy sessions at home or within the community, thus supporting sensory interventions OT practitioners implement for children. To continue to expand the SensoryFun! Toolkit© we plan on creating a manual for practitioners. This will further increase consistency and understanding of the toolkit through instruction on how to best utilize this resource in practice. We can obtain more feedback on the effectiveness of the toolkit by sharing this resource with practitioners. In addition to feedback from professionals, feedback from more parents would be beneficial in determining ways to improve our toolkit.

In order for the toolkit to become known in the OT community, we need to expand our outreach. Social media is a platform we can utilize to advertise to our target users, practitioners and parents or caregivers. Several pages and groups on Facebook focus on OT practice. We will inquire about creating a post that links Facebook users directly to our YouTube channels and website. We believe this would be the most helpful as many of these groups are followed by OT professionals who work in the field of pediatrics. As this resource is shared and gains exposure, it will be crucial to continue to gather feedback in order to meet the needs of the users. We

suggest future research to be done to determine the value and effectiveness of the SensoryFun!
Toolkit© through a qualitative study.

Summary & Conclusions

This project helps to bridge the gap between what practitioners understand and use in therapy sessions and what parents can do to address their children's sensory needs at home. Because of the limited resources available to parents, many children only receive sensory-enriching activities during therapy sessions. Since the toolkit is easy to understand and implement at home, children can now participate in more sensory activities during their daily lives. The next step of this project would be a qualitative research study to see if children's behavior could improve with the use of the toolkit. The toolkit could also be expanded to include more videos with different sensory activities as well as being expanded to more languages to continue making it more universal. The goal of this project was to close the gap between resources available to practitioners and families, while this toolkit is a start, there are still many ways in which the gap can continue to be filled.

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Appendix A

Dominican University Occupational Therapy Department Consent Form

Dominican University of California
Department of Occupational Therapy
50 Acacia Avenue
San Rafael, CA, 94901

CONSENT FOR PHOTOGRAPH/VIDEO/WRITTEN STORY USAGE

I understand that Dominican University of California makes extensive use of photographs, videotapes, and written stories in its advertising, publications on Google and other promotional materials. I further understand that the above listed materials will be viewed by the general public. I have been advised that I have the right to refuse to participate in photographs, videos, and publications of written stories. I hereby consent to participate in and authorize the use of my photograph, videos, and written stories by Dominican University for its advertising, publications on Google site, other promotional materials, and publications on Youtube.

Parent/Guardian Name

Child Volunteer/Model Name

Parent/Guardian Signature

Date

Appendix B

Promotional Proposal to for Parents & Child Volunteers

Dominican University of California

50 Acacia Ave
San Rafael, CA, 94901
(415) 457-4440

Creating a Sensory Diet Toolkit for Parents & Caregivers: A Capstone Project

**By Natalie Carrillo, Nicolette D'Esposito, Yvette Lozano,
& Sarah Pashby**

INTRODUCTION

The Integrated Capstone Experience (ICE) is a hallmark of a Dominican University Occupational Therapy education. This process provides us students with an opportunity for self-directed learning, and significantly enhances future professional and academic opportunities. ICE projects may also contribute to the body of knowledge in the profession, especially when they are publicly presented or published.

PROJECT OVERVIEW

Our integrated capstone project will focus on parent and caregiver education about Sensory Processing Disorder (SPD) and sensory diet and activities. SPD is defined as the brain not processing or organizing the flow of sensory impulses in a way that gives an individual good, precise information about him/herself or his or her world. Sensory play are activities that stimulate a child's senses of touch, smell, taste, movement, balance, sight and hearing. We will be creating a Youtube channel with a series of educational and instructional videos. For these videos we will need child volunteers to work with and be in the videos.

VOLUNTEER SPECIFICATIONS & REQUIREMENTS

1. Parents need to have read and signed the video/media release form.
2. Child volunteers must be 3-4 years old.
3. Parents and children volunteers must be available sometime during the months of February, March, and April for filming.

-
4. Parents and children volunteers must be available to attend 1-1 ½ hours for video filming sessions any day Friday through Monday (times will be later specified after participation confirmation).
 5. Parents and children volunteers may have to travel to various locations, such as the park or Dominican University.

VIDEO PROJECT DETAILS

Video filming sessions will last from 1 hour to 1 ½ hours. Our capstone group will video child volunteers in settings that imitate the home or film at locations within community, like playgrounds or the mall. In these videos the child volunteers will engage in certain play activities that can involve gross motor or fine motor movements, sitting down or running around, and playing with toys.

ACTIVITIES & TASKS CHILD VOLUNTEERS MAY ENGAGE IN

Sensorimotor Play & Sensory Activities Examples

- Playing with bubbles
- Playing on a jungle gym and going down a slide
- Playing in the sand
- Jumping and running
- Pushing and pulling carts or strollers with some weight
- Spinning
- Swinging
- Rolling down a grassy hill or being barefoot in the grass
- Listening to calming music or sounds of nature
- Playing tag
- Eating different textured snacks, such as crunchy cereal, or different flavored snacks, such as sour apples.

If you and your child are interested in volunteering contact me at, nicolette@inthecave.com or nicolette.desposito@students.dominican.edu. Feel free to email me with any questions or if you need more information.

Appendix C

SurveyMonkey Online Questionnaire for Parent Feedback

Parent Survey - YouTube Channel & Videos

1. **Were you able to navigate the YouTube Channel?**
[Scale Range Label]
(Left side - 0) Easy to navigate — (Right side - 10) Difficult to navigate
2. **How many videos interested you or seemed relevant to you and your family?**
[Scale Range Label]
(Left side - 0) — (Right side - 10)
3. **How many videos did you watch? If one or more did you watch the entire video?**
[Multiple Choice]
 - I did not watch any videos.
 - I watched part of a video.
 - I watched an entire video.
 - I watched more than 1 entire video. [Enter number of videos watched]
4. **Did you watch the videos in English or Spanish?**
[Multiple Choice]
 - English
 - Spanish
 - Both
 - Neither
5. **Were you able to understand the video content?**
[Multiple Choice]
 - Yes, easy to understand.
 - Somewhat.
 - Not at all.
 - I did not watch any videos
6. **Did you try any activities or techniques demonstrated in the videos?**
[Multiple Choice]
 - Yes
 - No
7. **If you answered yes to the previous question, when did you use an activity or technique?**
Did the activity help your child? Did you and your child have fun?
[Comment Box]
8. **Would you recommend these videos to other parents or families?**
[Multiple Choice]
 - Yes
 - No
9. **Any comments, feedback, or suggestions about the YouTube channel or videos?**
[Comment Box]